

FINAL REPORT
FORT RICHARDSON
OUE-AVMA

GROUNDWATER MONITORING REPORT

FORT RICHARDSON, ALASKA

PREPARED FOR:



U.S. Army, Directorate of Public Works
Contract No. W911KB-04-P-0091

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US Army
Installation Management Agency



US Army Corps
of Engineers®
Alaska District



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LIST OF ACRONYMS

AAC	Alaska Administrative Code
ADEC	Alaska Department of Environmental Conservation
AVMA	Armored Vehicle Maintenance Area
bgs	below ground surface
CERCLA	Comprehensive Environmental Response, Compensation and Liability Act
CRREL	Cold Regions Research Engineering Laboratory
CoC	Chemical of Concern
DCE	Dichloroethene
DO	Dissolved Oxygen
DPW	Directorate of Public Works
EPA	Environmental Protection Agency
Fe	Iron
FFA	Federal Facilities Agreement
FTOC	From Top of Casing
GPS	Global Positioning Satellite
IRP	Installation Restoration Program
IDW	Investigation Derived Waste
J	the quantitation is an estimate
J+	Reported value may not be accurate or precise (estimated high)
MNA	Monitored Natural Attenuation
Mn	Manganese
MDL	Method Detection Limit
µg/L	microgram per Liter
MS/MSD	Matrix Spike/ Matrix Spike Duplicate
NA	Not Applicable
ND	Not Detected
ORP	Oxidation-Reduction Potential
OUE	Operable Unit E
PAH	Polynuclear Aromatic Hydrocarbons
PCE	Tetrachloroethene
pH	potential Hydrogen
POC	Point of Contact
PVC	Poly Vinyl Chloride
PRG	Preliminary Remediation Goals
PQL	Practical Quantitation Limit
QC	Quality Control
RI/FS	Remedial Investigation/Feasibility Study
ROD	Record of Decision
SAP	Sampling and Analysis Plan
SIMS	Selective Ion Monitoring
USACE	United States Army Corp of Engineers
USGS	United States Geologic Survey
UST	Underground Storage Tank
VOC	Volatile Organic Compound

LIST OF ACRONYMS *(continued)*

WGS World Geodetic System

1.0 INTRODUCTION

Groundwater sampling activities at Operable Unit E (OUE)-Armored Vehicle Maintenance Area (AVMA) were conducted for the U.S. Army Directorate of Public Works (DPW) during October 2005 under United States Army Corps of Engineers (USACE) Contract Number W911KB-04-P-0091.

Annual groundwater sampling was established under the Installation Restoration Program (IRP) to address the needs of multiple programs at Fort Richardson Army Post. These programs include the Comprehensive Environmental Response, Compensation and Liability Act (CERCLA), Federal Facilities Agreement (FFA), and the Alaska state program sites.

This report was developed to chronicle results from the groundwater sampling event at OUE-AVMA conducted between 18 and 19 October, 2005. The report summarizes and evaluates laboratory data collected and compares these findings with appropriate cleanup standards and timelines.

Figure 2-1 shows the location of Fort Richardson Army Post land boundaries relative to Anchorage, Alaska.

2.0 BACKGROUND INFORMATION

2.1 Physical Setting

Fort Richardson Army Post lies in an alluvial plain, often referred to as the Anchorage Lowland, which is bordered on the east by the Chugach Mountains and on the north, south, and west by waters of the Cook Inlet (Figure 2-1). Fort Richardson Army Post is situated in a transitional zone on the eastern edge of the Anchorage Lowland and is inundated with four major drainages that originate in the Chugach Mountains. The topography of Fort Richardson Army Post has been highly influenced by glacial activity and the effects of stream deposition and erosion.

Eagle River and Ship Creek are the primary streams on the installation, running from east to west. Ship Creek, the primary water source for Fort Richardson Army Post and Elmendorf Air Force Base, runs through Fort Richardson Army Post. Fort Richardson Army Post obtains drinking water from the Ship Creek Dam Reservoir and has several emergency water supply wells near Ship Creek. Groundwater used for the emergency water supply is obtained from the confined aquifer in the Knik outwash deposit. Water storage for Fort Richardson Army Post is provided by a permanent 2.5 million gallon underground reservoir in the Elmendorf Moraine, and by the Ship Creek Dam Reservoir at the base of the Chugach Mountain Range. A water treatment plant near the dam processes the drinking water. A drinking water well is located at the Otter Lake Recreational Facility, located approximately two miles from the cantonment area. (ICRC, 2003)

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Figure 2-1 Location of Fort Richardson Army Post



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2.2 Environmental History

In 1988, the Environmental Protection Agency (EPA) Region 10 placed Fort Richardson Army Post on the hazardous waste compliance docket. The Army's investigation of contaminated sites at Fort Richardson Army Post under the IRP began in 1988. The objectives of the IRP are to assess sites where potentially hazardous material may exist and to develop and recommend remedial actions for those sites that pose a threat to human health and welfare or the environment. (CH2MHILL, 2004)

The history of site OUE-AVMA (Table 2-1) is largely based upon analysis of aerial photos and information obtained from interviews of former Army employees. The disposal area east of Building 45-590, located in the northwest quadrant of the OUE-AVMA area, was discovered by interviews with former Army employees and historical air photos from 1957, 1960, and 1966. The chlorinated solvents that have caused groundwater contamination formerly associated with building 45-590 on site OUE have been determined to be from another source area. (CH2MHILL, 2004) OUE-AVMA location and the approximate location of Former Building 45-590 are illustrated in Figure 2-2.

In 1990, the USACE conducted an Underground Storage Tank (UST) remediation sampling program at the former UST location on site OUE-AVMA. The program assessed the presence and extent of fuel contamination in the soil and groundwater. (USACE, 1990)

In 1994, ENSR conducted a limited field investigation of the entire site. Complete results of the investigation are presented in the report *Preliminary Source Evaluation 2, Operable Unit D, Fort Richardson, Alaska*. (ENSR, 1996) The objective of this investigation was to evaluate the presence of contamination in soil and sediment, the possible downward migration of contaminants, and potential source areas for groundwater contamination.

In 2000, US Army Cold Regions Research and Engineering Laboratory (CRREL) conducted geophysical investigations to identify the location of the former burn pit and evaluate the character of the parking lot excavation and refill with possibly contaminated soils. (Astley et al., 2000)

In 2004, Satori Group Inc. was contracted to perform two rounds of low-flow groundwater sampling at OUE-AVMA. Ten wells were sampled and analyzed in August and October.

Satori Group, Inc continued low-flow groundwater sampling in May 2005. Ten wells were sampled and analyzed during this period.

The purpose of long-term monitoring at OUE-AVMA is to monitor natural attenuation and contaminant migration. Plume monitoring will track the degradation of the Chemicals of Concern (CoCs) in order to achieve the two program goals.

Table 2-1 outlines the history of OUE-AVMA from 1950 to present. Each year is accompanied with a brief description of important activities for that year.

Table 2-1 Site OUE-AVMA Activity History

Year	Organization/Company	Activity
1950 - 1966*	Fort Richardson Army Post	Low level armored vehicle maintenance, oil and other waste material disposal
1990	USACE	UST remediation sampling program on OUE-AVMA
1993	Harding Lawson Assoc.	Site assessment at UST location on OUE-AVMA
1994	ENSR	Field investigation site OUE-AVMA
1996	Ecology and Environment Inc.	Background data analysis, soil borings, and groundwater sampling
1996,1997, 1998	ENSR	Site investigation of Bldg 35-752 on site OUE-AVMA
2000	CRREL	Geophysical investigation
2001	CRREL	Historic aerial photography analysis and geophysical investigation
2001	USACE	Monitoring well installation, soil borings, groundwater sampling
2002	CH2MHill	Chemical quality assurance report AVMA-Bldg 35-752
2003	CH2MHill	Sampled wells AP-3467, AP-3468, AP-3534, AP-3789, AP-3901, AP-3916, and AP-4341 on AVMA. Sampled wells AP-2982, AP-2983, and AP-3503 at Bldg. 35-752.
2004	Satori Group Inc.	Sampled wells AP-3468, AP-3534, AP-3774, AP-3870, AP-3871, AP-3893, AP-4341, AP-4342, AP-4411, and AP-4413
2005	Satori Group Inc.	Sampled wells AP-3468, AP-3534, AP-3774, AP-3870, AP-3871, AP-3893, AP-4341, AP-4342, AP-4411, and AP-4413

Source: Preliminary Site Characterization Report (CH2M Hill 2003)

* It is undetermined when the facility was no longer used as a maintenance area. The latest aerial photo reviewed was taken in 1967.

Figure 2-2 OUE-AVMA Location

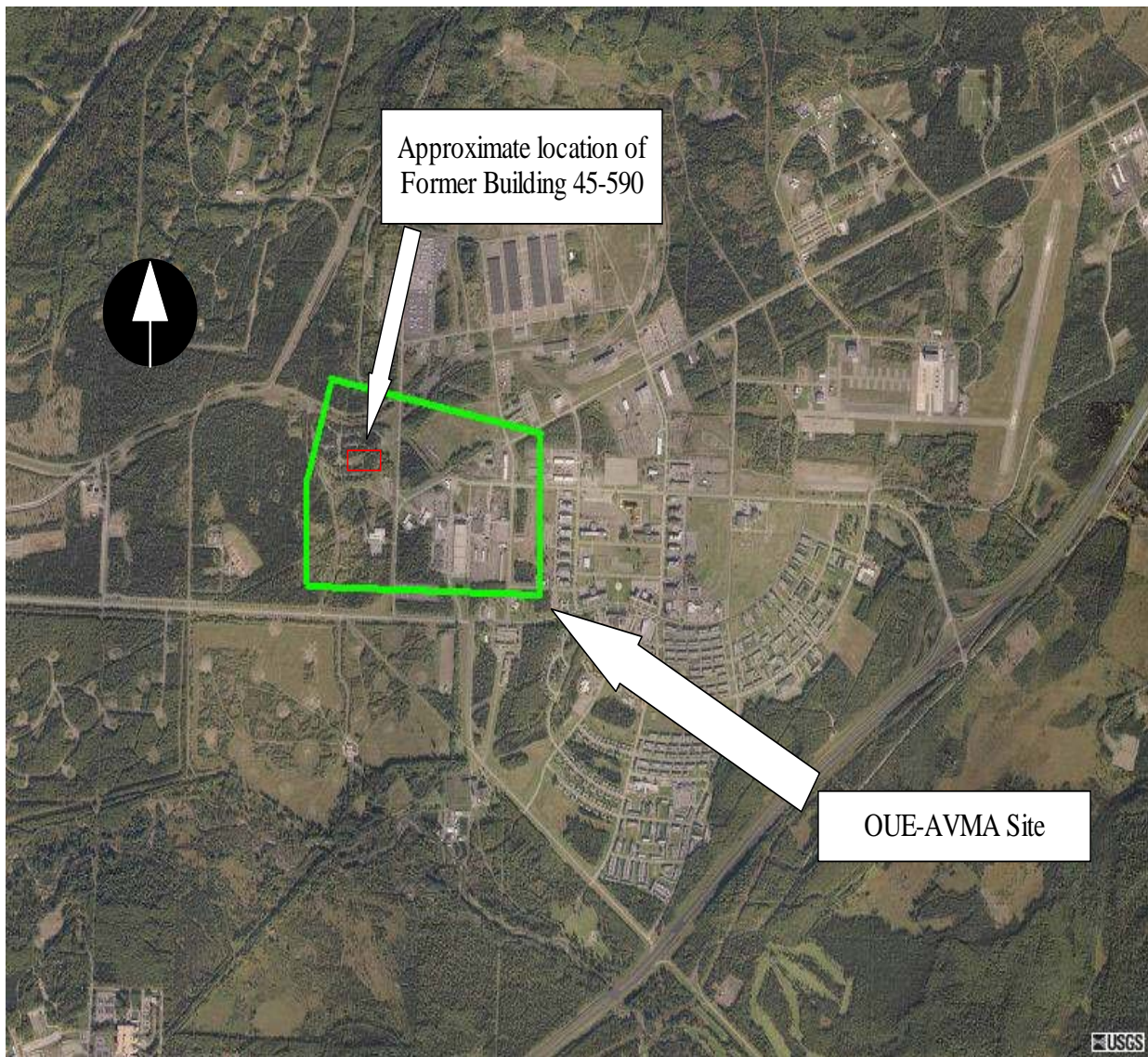


Image courtesy of the United States Geological Survey (USGS), 2002.

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2.3 Regulatory Requirements

The OUE-AVMA Remedial Investigation / Feasibility Study (RI/FS) identified groundwater contamination at the AVMA that requires action under CERCLA. The need for remedial action was based on a determination that contaminants in groundwater pose an unacceptable risk to human health if ingested, and that contaminant levels in groundwater exceed state and federal drinking water standards. Concentrations of chemicals in groundwater that primarily contribute to Excess Lifetime Cancer Risks that exceed 1-in-10,000 (based on a hypothetical conservative residential exposure scenario) were considered CoCs. (CH2MHILL, 2004)

Previously, the chemicals of concern in groundwater at the AVMA were Tetrachloroethene (PCE) and dibenzo (a,h) anthracene. Since a Record of Decision (ROD) has not been signed at this time, the 2004 EPA Region 9 Preliminary Remediation Goals (PRG) are used for comparison to OUE-AVMA (Table 2-2). The analysis for dibenzo (a,h) anthracene was again included for well AP-3893 in October 2005 by Satori per statement of work. The last known historical sampling for this analyte was performed by CH2MHill in August 2002.

It is the request of the DPW that analyte results for wells are screened against the PRG values as well as the Alaska Department of Environmental Conservation (ADEC) Cleanup Criteria (Table 5-1).

Table 2-2 Screening Values for Result Comparison at OUE-AVMA

Contaminant	Preliminary Remediation Goals 2004
	Tap Water (µg/L)
Aluminum	36000
Arsenic	0.045
Carbon Tetrachloride	0.17
Chloroform	0.17
Methylene chloride	4.3
Dibenzo (a,h) anthracene	.009¹
Tetrachloroethene	0.10
1,1,1,2-Tetrachloroethane	0.43

¹Value derived from screening value in the document "Proposed Plan for Remedial Action at OUE, Fort Richardson, AK" April 2004, CH2MHill.
Source: EPA Region 9 PRG Table 2004
µg/L-microgram per Liter
CoCs are bold

3.0 FIELD ACTIVITIES

3.1 Sample Collection Methodologies

All field activities were conducted in accordance with the *Sampling and Analysis Plan (SAP), Former Building 762, Former Building 786, Operable Unit B (Poleline Road), and Operable Unit E (Armored Vehicle Maintenance Area), Technical Memorandum, August 2004. (SGI, 2004)*

Initial static water level measurements were collected prior to groundwater removal to establish groundwater elevation and drawdown. Groundwater samples were collected utilizing the low-flow sample collection protocol; where low-flow techniques could not be used, samples were collected with disposable bailers. Sample collection time was determined once well stabilization parameters were achieved. If well stabilization parameters were not achieved within the 12 data cells on the USACE Alaska District Low Flow with Minimal Drawdown Form, a new form was used until stabilization parameters were met (Appendix A).

In the event individual wells contained minimal water for low flow sampling, a minimum of four casing volumes of water were removed or the well was purged dry using a bailer. Groundwater samples were then collected after two hours had expired. Wells that exhibited slow recharge during low-flow purging had drawdowns greater than 0.3', although pressure, charge, and exhaust settings affecting flow rates were continually adjusted.

Low-flow groundwater pumping was accomplished with a Geotech[®] Bladder Pump, model Geo1.66SS36 and regulated using the Geotech[®] Geocontroller[®] 2. Teflon[®] bonded tubing from the October 2004 groundwater event was stored and re-used for 2005. Parameters were measured with a YSI[®] Model 556 flow-through multi-meter calibrated daily. Prior to sample collection, the YSI[®] flow-through cell was removed from the sampling train and samples were collected directly from the Teflon[®] bonded tubing discharge line.

3.2 Field Collection

The first sampling event at OUE-AVMA was conducted between 18 and 19 October 2005. Table 3-1 provides well names, inspection information, depth to groundwater measurements in feet FTOC, total well depth as measured in October 2005, sampling collection methods, and Global Positioning Satellite (GPS) locations. Well AP-4342 had an obstruction at approximately 70 feet below ground surface (bgs) which prevented the use of a bladder pump. Due to the insufficient water column (<36") required to measure drawdown while using a bladder pump, AP-4413 was sampled with a bailer. AP-4341 had a sufficient water column but had insignificant recharge, therefore was bailer sampled. Field data collected during the sampling event is presented in Appendix B.

3.3 Quality Control (QC)

Five types of QC samples were collected to ensure data quality: trip blanks, field rinsate, field duplicates, and matrix spike/matrix spike duplicates (MS/MSD). Appendix C contains a sample inventory record and laboratory data review is presented as Appendix E.

3.3 Investigation Derived Waste (IDW)

IDW generated during the project included water from well purging and equipment decontamination. Wastewater was deposited into 15-gallon or 35-gallon drums and transported to the environmental staging facility. A total of 119 gallons (combination of purge water and decontamination water) were disposed of during October 2005. All drums were labeled with USACE project number, point of contact (POC), date, site location, and well sampled before relinquishing drums for disposal.

Table 3-1 OUE–AVMA Well Information

MONITORING WELL	CONDITION	DEPTH TO WATER (feet FTOC) ¹	TOTAL DEPTH (feet FTOC) ¹	COLLECTION METHOD	GPS COORDINATES ²
		October 2005	October 2005	October 2005	
AP-3468	Good	105.98	115.90	Bladder Pump	N 61° 15.504' W 149° 43.000'
AP-3534	Good	105.60	140.40	Bladder Pump	N 61° 15.503' W 149° 43.004'
AP-3774	Good	102.52	117.60	Bladder Pump	N 61° 15.519' W 149° 43.348'
AP-3870	Good/CRREL Monitor	95.29	110.70	Bladder Pump	N 61° 15.525' W 149° 43.580'
AP-3871	Good	106.34	121.10	Bladder Pump	N 61° 15.591' W 149° 43.146'
AP-3893	Good	87.36	125.60	Bladder Pump	N 61° 15.511' W 149° 42.294'
AP-4341	Good	63.97	68.10	Bailer ⁴	N 61°15.379' W 149°42.883'
AP-4342	PVC obstructed at ~70ft bgs. Bladder pump impassable	97.02	101.90	Bailer ³	N 61° 15.455' W 149° 42.995'
AP-4411	Flush mount well/Good Condition	67.49	72.80	Bladder Pump	N 61° 15.449' W 149° 42.806'
AP-4413	Good	72.13	75.40	Bailer ⁴	N 61° 15.385' W 149° 42.952'

¹ from top of casing (FTOC)

² World Geodetic System (WGS) 84

³ Bladder pump was impassable in column

⁴ Insufficient water to sample with low flow water bladder pump
PVC = Poly Vinyl Chloride

4.0 FIELD AND ANALYTICAL METHODS

Data obtained during the October 2005 sampling program was obtained using a combination of laboratory analytical methods and field parameter measurements. The following sections detail these methods.

4.1 Field Parameters

The following field parameters were met before sampling commenced:

Temperature

The rate of contaminant uptake increases as temperature increases. Stability is necessary to keep analyte concentrations static during sampling period. (USACE, 2001)

Potential Hydrogen (pH)

Changes in pH may lead to the precipitation of metal species. These particulates are then erroneously filtered and may lead to a negative bias in the filtered sample results. (USACE, 2001)

Conductivity

Conductivity measurements provide an estimation of dissolved ionic matter in the water. A sudden change in conductivity can indicate a direct discharge or other source of pollution into the water. (GVSU¹, 2005)

Oxidation - Reduction Potential (ORP)

Measuring the ORP of water indicates the tendency to accept or transfer electrons. An oxidizing environment is needed to convert any ammonia to nitrites and nitrates. If nitrates or nitrites are tested analytes, stability is necessary to control production during sampling period. (EE, 2003)

Dissolved Oxygen (DO)

Changes in DO levels represent the build-up of organic wastes. A decrease in DO is usually an indication of an influx of an organic pollutant. DO is a function of water temperature. (GVSU², 2005)

Turbidity

Low sample turbidity is crucial to metals analysis. High turbidity can result in a high metals analytical result. (USACE, 2001)

4.2 Analytical Methods

Samples submitted for laboratory analysis were analyzed for Volatile Organic Compounds (VOC) using method SW 8260B; Dissolved metals (Iron (Fe) and Manganese (Mn)) using method SW 6020; Chloride, Sulfate, Nitrate, and Nitrite using method EPA 300.0; Methane, Ethane and Ethene using method RSK 175; and Polynuclear Aromatic Hydrocarbons (PAHs) using method 8270C Selective Ion Monitoring (SIMS).

SW 8260B – Volatile Organic Compounds (VOCs)

This analysis provides a gas chromatograph/mass spectrometer reading of a range of volatile organic compounds. It can be used to quantify a range of organic compounds that have boiling points below 200°C. This range of compounds includes all CoCs for this project.

SW 6020 – Dissolved Metals - Iron (Fe), Manganese (Mn)

Both Fe (III) and Mn (IV) can be used as an electron acceptor during anaerobic biodegradation of organic carbon and therefore compete with chlorinated hydrocarbon compounds in redox reactions. Elevated levels of the reduced forms of these metals (Fe III, Mn III, and Mn IV) are a positive indicator of anaerobic conditions conducive to the degradation of chlorinated hydrocarbons.

EPA 300.0 – Chloride, Sulfate, Nitrate, and Nitrite

Nitrate/Nitrite and Sulfate are competing electron acceptors. In order for reductive dechlorination to occur, nitrate/nitrite and sulfate concentrations in the contaminated portion of the aquifer must be low relative to background. Inorganic chloride accumulates as a result of reductive dechlorination. In aquifers with a low background of inorganic chloride, the concentration of inorganic chloride should increase as the chlorinated solvents degrade. (USACE 2003)

RSK 175 – Light Gases - Methane, Ethane, and Ethene

The presence of methane in groundwater is indicative of strongly reducing conditions. Because methane is not present in fuel, the presence of methane above background concentrations in groundwater in contact with fuels is indicative of microbial degradation of hydrocarbons. Methane also is associated with spills of pure chlorinated solvents (Weaver *et al.*, 1995). It is not known if the methane comes from chlorinated solvent carbon or from native dissolved organic carbon. Ethane and ethene represent the end products of reductive dechlorination. (EPA 1998)

8270C SIMS – Polynuclear Aromatic Hydrocarbons (PAHs)

Method 8270C SIMS can be used to quantitate most neutral, acidic, and basic organic compounds that are soluble in methylene chloride and capable of being eluted. Such compounds include PAHs, chlorinated hydrocarbons and pesticides, phthalate esters, organophosphate esters, nitrosamines, haloethers, aldehydes, ethers, ketones, anilines, pyridines, quinolines, aromatic nitro compounds, and phenols, including nitrophenols. (EPA 1996b)

5.0 RESULTS

Table 5-1 presents the 2005 analytical results for analytes detected during the October sampling period and historical sampling dates and results. Also presented in the table for comparison are the EPA 2004 PRG values and the ADEC 18 Alaska Administrative Code (AAC) 75.345 Table C Cleanup Criteria. The ADEC clean up criteria were used to determine regulatory exceedances and base remedial actions. Analytes exceeding the ADEC clean up criteria or the EPA 2004 PRG values are shown as bold in Table 5-1.

Figure 5-1 presents well locations at site OUE-AVMA, 2005 sample results, historical data, ADEC cleanup criteria, and EPA 2004 PRG values. Analytes exceeding the ADEC clean up criteria or the EPA 2004 PRG values are shown as bold in Table 5-1. Analytes exceeding the ADEC clean up criteria or the EPA 2004 PRG values are shown as bold in Figure 5-1.

All wells in site OUE-AVMA were evaluated using the EPA monitored natural attenuation (MNA) screening protocol. The MNA screening protocol revealed inadequate evidence of biodegradation in October 2005. Refer to Attachment 1 for individual MNA well results.

Laboratory analytical results are located in Appendix D.

5.1 SW 8260B – VOC -- Volatile Organic Compounds

VOC concentrations detected during the sampling event are as follows:

- Chloroform was detected in five of ten wells in October with concentrations ranging from 0.320 J $\mu\text{g/L}$ at AP-3468 to 2.92 $\mu\text{g/L}$ at AP-3871.
- Carbon tetrachloride was detected in six of ten wells in October with concentrations ranging from 0.370 J $\mu\text{g/L}$ at AP-4341 to 1.08 $\mu\text{g/L}$ at AP-4413.
- Tetrachloroethene (PCE) was detected in eight of ten wells in October with concentrations ranging from 0.330 J+ $\mu\text{g/L}$ at AP-3774 to 143 $\mu\text{g/L}$ at AP-4413.

5.2 SW 6020 – Dissolved Metals

Sample volumes for dissolved metals analysis were filtered through a 0.45 micron filter cartridge before being decanted into laboratory containers. Dissolved metal concentrations detected during the sampling event are as follows:

- Arsenic was detected in one of ten wells in October with a concentration of 13.5 $\mu\text{g/L}$ at AP-3893.
- Manganese was detected in four of ten wells in October with concentrations ranging from 0.709 J $\mu\text{g/L}$ at AP-4413 to 14.4 $\mu\text{g/L}$ at AP-4341.

5.3 EPA 300.0 – Chloride, Sulfate, Nitrate and Nitrite

Concentrations detected during the sampling event are as follows:

- Chloride was not detected in any of the ten wells during October 2005.
- Nitrate/Nitrite was detected in all ten wells in October with concentrations ranging from 144J+ µg/L at AP-3893 to 3,470 µg/L at AP-3470.
- Sulfate was detected in all ten wells in October with concentrations ranging from 16,400 µg/L at AP-4411 to 25,600 µg/L at AP-3774.

5.4 RSK 175 – Light Gases – Methane, Ethane and Ethene

Methane, Ethane, and Ethene were not detected in any of the OUE-AVMA wells sampled during October 2005.

5.5 Contaminant Distribution and Trends

Concentrations of PCE exceeded the ADEC 18 AAC 75.345 Table C Cleanup Criteria of 5.0 µg/L in seven wells, while eight wells exceeded the EPA 2004 PRG values for PCE. However, the levels of PCE concentration have decreased from the May/June sampling event for all but two wells. These two wells are AP-4411 where the increase is slight and AP-4413 which showed a higher increase from the previous sampling event during May/June 2005.

No detections of associated daughter products from the degradation of PCE were observed. PCE was not detected in any sentinel wells outside the estimated plume boundary. PCE trends are illustrated in Figure 5-2.

Dibenzo (a,h) anthracene was not detected in well AP-3893 during October 2005.

5.6 Monitored Natural Attenuation Evaluation (MNA)

All the OUE-AVMA wells were scored using analytical parameters and a preliminary screening process to determine if biodegradation of PCE is occurring. (EPA 1998) Attachment 1 contains the results of the scoring, methodology, and interpretation of the score as it pertains to biodegradation of chlorinated organics.

Using the screening process, all wells scored exhibited inadequate evidence of biodegradation of chlorinated solvents during the October 2005 sampling event.

Table 5-1 OUE-AVMA Sample Results

WELL ID	Sample ID 0510FROAWA	Analyte	Analytical Method	Units µg/L	Sample Dates and Results					Cleanup Criteria	
	October 2005				March ¹ 2001	August ² 2004	October ² 2004	May ² & June ² 2005	October ² 2005	ADEC Groundwater 18AAC75.345 Table C (µg/L)	Preliminary Remediation Goal - 2004
AP-3871	01	Methylene chloride	SW 8260B	µg/L	ND (0.4)	ND (5.0)B	ND (5.0)	ND (5.0)	ND (5.0)	5	4.3
		Chloroform	SW 8260B	µg/L	3.5	3.26	2.70	3.00	2.92	100	0.17
		Carbon tetrachloride	SW 8260B	µg/L	0.044	0.52J	ND (1.0)	ND (1.0)	0.840J	5	0.17
AP-3774	02	Aluminum	SW 6020	µg/L		ND (100)	117	ND (100)	ND (100)	NA	36000
		Methylene chloride	SW 8260B	µg/L		ND (5.0)B	ND (5.0)	ND (5.0)	ND (5.0)	5	4.3
		Carbon tetrachloride	SW 8260B	µg/L		ND (1.0)	ND (1.0)	ND (1.0)	0.390J	5	0.17
		Trichloroethene	SW 8260B	µg/L		ND (1.0)	ND (1.0)	ND (1.0)	0.710J	5	NA
		Tetrachloroethene	SW 8260B	µg/L		ND (1.0)	ND (1.0)	0.740J	0.330J+	5	0.10
AP-3893	03	Arsenic	SW 6020	µg/L		20.7	16.9	18.3	13.5	50	.045
		Methylene chloride	SW 8260B	µg/L		ND (5.0)B	ND (5.0)	ND (5.0)	ND (5.0)	5	4.3
AP-3468	04	Arsenic	SW 6020	µg/L		3.53J	ND (10)	ND(10)	ND (10)	50	.045
		Aluminum	SW 6020	µg/L		ND (100)	ND (100)	72.8J	ND (100)	NA	36000
		Methylene chloride	SW 8260B	µg/L	ND (0.4)	ND (5.0)B	ND (5.0)	ND (5.0)	ND (5.0)	5	4.3
		Chloroform	SW 8260B	µg/L	1.6	0.54J	0.44J	ND (1.0)	0.320J	100	0.17
		Chloroform (Dup.)	SW 8260B	µg/L			0.44J			100	0.17
		Carbon tetrachloride	SW 8260B	µg/L	0.055J	0.32J	ND (1.0)	ND (1.0)	ND (1.0)	5	0.17
		Tetrachloroethene	SW 8260B	µg/L	ND (0.4)	60	53	93.6	59.4	5	0.10
		Tetrachloroethene (Dup.)	SW 8260B	µg/L			53.3			5	0.10

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WELL ID	Sample ID 0510FROAWA	Analyte	Analytical Method	Units µg/L	Sample Dates and Results					Cleanup Criteria	
	October 2005				March ¹ 2001	August ² 2004	October ² 2004	May ² & June ² 2005	October ² 2005	ADEC Groundwater 18AAC75.345 Table C (µg/L)	Preliminary Remediation Goal - 2004
AP-3534	05	Methylene chloride	SW 8260B	µg/L	ND (0.4)	ND (5.0)B	ND (5.0)	ND (5.0)	ND (5.0)	5	4.3
		Chloroform	SW 8260B	µg/L	0.056J	ND (1.0)	ND (1.0)	ND (1.0)	ND (1.0)	100	0.17
		Tetrachloroethene	SW 8260B	µg/L	19	25.4	24.1	81.5	59.1	5	0.10
		Carbon tetrachloride	SW 8260B	µg/L	0.07J	ND (1.0)	ND (1.0)	ND (1.0)	ND (1.0)	5	0.17
		Methylene chloride (Dup.)	SW 8260B	µg/L		ND (5.0)B		ND(5.0)		5	4.3
		Carbon tetrachloride (Dup.)	SW 8260B	µg/L		0.42J		0.490J		5	0.17
		Tetrachloroethene (Dup.)	SW 8260B	µg/L		25.4		68.1		5	0.10
AP-3870	06	Methylene chloride	SW 8260B	µg/L		ND (5.0)B	ND (5.0)	ND (5.0)	ND (5.0)	5	4.3
		Chloroform	SW 8260B	µg/L		ND (1.0)	0.3J	0.340J	0.350J	100	0.17
		Tetrachloroethene	SW 8260B	µg/L		ND (1.0)	0.41J	ND (1.0)	ND (1.0)	5	0.10
	07 (Duplicate)	Carbon Disulfide (Dup)	SW 8260B	µg/L					1.13J	3650	NA
		Chloroform (Dup)	SW 8260B	µg/L					.370J	100	0.17
		Carbon tetrachloride (Dup)	SW 8260B	µg/L					ND(1.0)	5	0.17
		Tetrachloroethene (Dup)	SW 8260B	µg/L					ND(1.0)	5	0.10
AP-4411	08	Aluminum	SW 6020	µg/L		ND (100)	15100	ND (100)	ND (100)	NA	36000
		Arsenic	SW 6020	µg/L		ND (10.0)	3.78J	ND (10.0)	ND (10.0)	50	.045
		Methylene chloride	SW 8260B	µg/L		ND (5.0)B	ND (5.0)	ND (5.0)	ND (5.0)	5	4.3
		Tetrachloroethene	SW 8260B	µg/L		11.2	20.4	23.9	24.6	5	0.10

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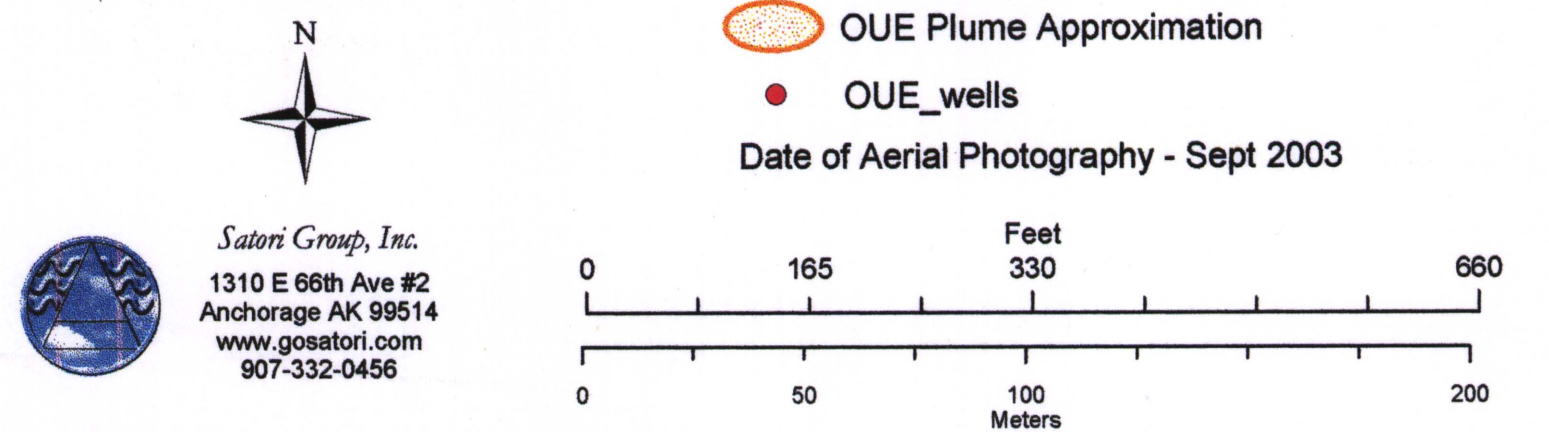
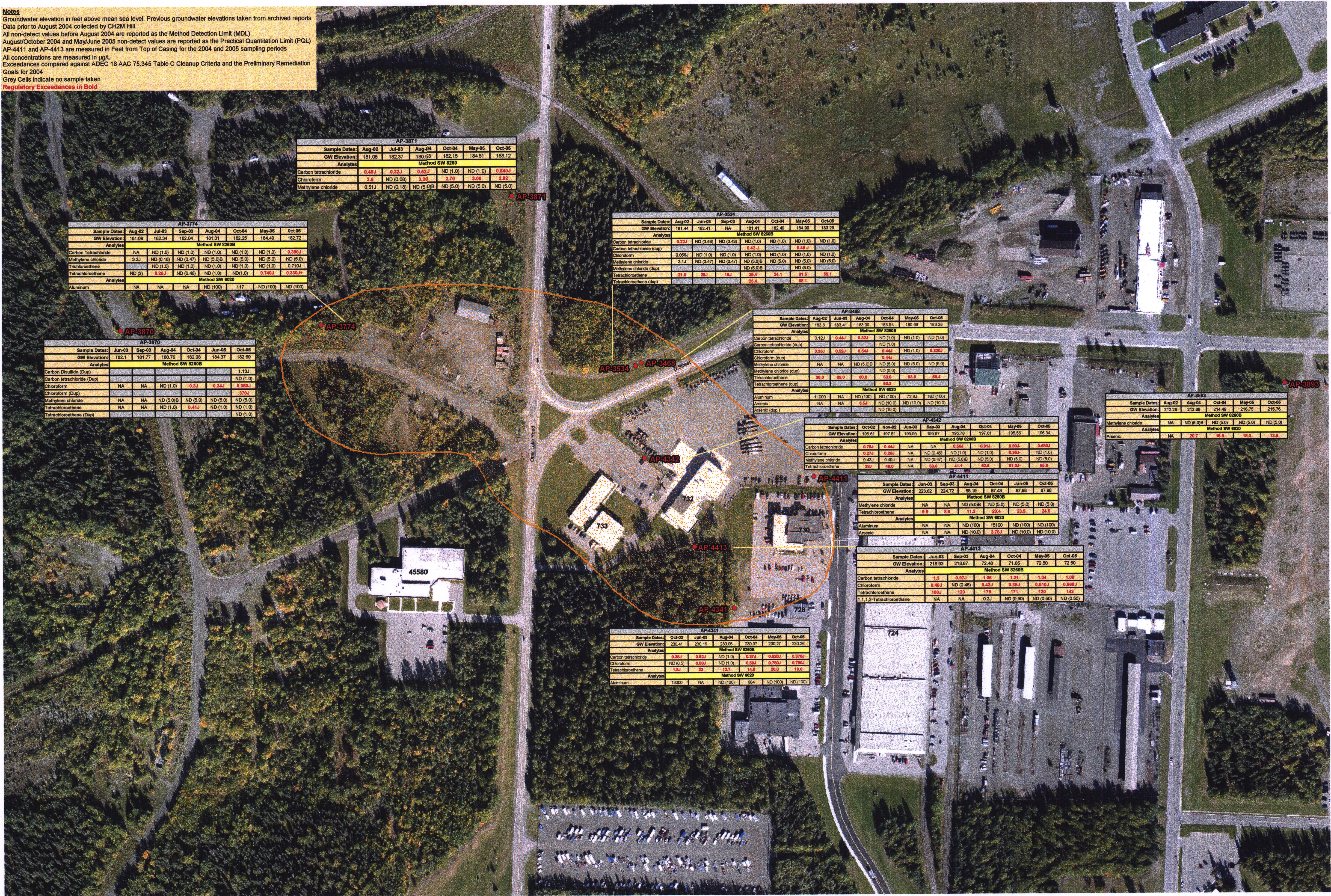
WELL ID	Sample ID 0510FROAWA	Analyte	Analytical Method	Units µg/L	Sample Dates and Results					Cleanup Criteria	
	October 2005				March ¹ 2001	August ² 2004	October ² 2004	May ² & June ² 2005	October ² 2005	ADEC Groundwater 18AAC75.345 Table C (µg/L)	Preliminary Remediation Goal - 2004
AP-4413	10	Chloroform	SW 8260B	µg/L		0.42J	0.38J	0.510J	0.660J	100	0.17
		Carbon tetrachloride	SW 8260B	µg/L		1.06	1.21	1.04	1.08	5	0.17
		Tetrachloroethene	SW 8260B	µg/L		175	171	120	143	5	0.10
		1,1,1,2 Tetrachloroethane	SW 8260B	µg/L		0.2J	ND (0.500)	ND (0.500)	ND (0.500)	NA	.43
AP-4341	11	Aluminum	SW 6020	µg/L		ND (100)	684	ND (100)	ND (100)	NA	36000
		Chloroform	SW 8260B	µg/L		ND (1.0)	0.50J	0.780J	0.780J	100	0.17
		Carbon tetrachloride	SW 8260B	µg/L		ND (1.0)	0.37J	0.520J	0.370J	5	0.17
		Tetrachloroethene	SW 8260B	µg/L		12.7	14.6	20.8	19.0	5	0.10
AP-4342	12	Methylene chloride	SW 8260B	µg/L		ND (5.0)B	ND (5.0)	ND (5.0)	ND (5.0)	5	4.3
		Chloroform	SW 8260B	µg/L		ND (1.0)	ND (1.0)	0.350J-	ND (1.0)	100	0.17
		Carbon tetrachloride	SW 8260B	µg/L		0.58J	0.91J	0.90J-	0.680J	5	0.17
		Tetrachloroethene	SW 8260B	µg/L		41.1	62.5	61.3J-	55.90	5	0.10

NA= Not Applicable
 ND= No Analyte Detected
 J = The quantitation is an estimate
 J- = Analyte is present, but value may not be accurate or precise (estimated low)

Regulatory Exceedances in Bold
 Grey cells indicate no sample taken
¹No analyte detected reported in Method Detection Limit (MDL)
²No analyte detected reported in Practical Quantitation Limit (PQL)

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Notes
 Groundwater elevation in feet above mean sea level. Previous groundwater elevations taken from archived reports Data prior to August 2004 collected by CH2M Hill
 All non-detect values before August 2004 are reported as the Method Detection Limit (MDL)
 August/October 2004 and May/June 2005 non-detect values are reported as the Practical Quantitation Limit (PQL)
 AP-4411 and AP-4413 are measured in Feet from Top of Casing for the 2004 and 2005 sampling periods
 All concentrations are measured in µg/L
 Exceedances compared against ADEC 18 AAC 75.345 Table C Cleanup Criteria and the Preliminary Remediation Goals for 2004
 Grey Cells indicate no sample taken
Regulatory Exceedances in Bold



Abbreviations
 ADEC = Alaska Department of Environmental Conservation
 Dup = Duplicate Sample
 ND = No Analyte Detected
 B = Lab Blank Contamination
 J = Estimated Quantity
 J+ = Analyte is present, but value may not be accurate or precise (estimated high)
 J- = Analyte is present, but value may not be accurate or precise (estimated low)

**OUE Armored Vehicle Maintenance Area
 2005 October Groundwater Analytical Results
 Fort Richardson, Alaska**

Cleanup Level Values

Analyte	ADEC 18 AAC 75.345 Table C Cleanup Criteria	Preliminary Remediation Goal - 2004
Aluminum	NA	36000 µg/L
Arsenic	50 µg/L	.045 µg/L
Carbon Disulfide	3650 µg/L	NA
Carbon Tetrachloride	5 µg/L	0.17 µg/L
Chloroform	100 µg/L	0.17 µg/L
Methylene Chloride	5 µg/L	4.3 µg/L
Tetrachloroethane	5 µg/L	0.10 µg/L
Trichloroethane	5 µg/L	NA
1,1,1,2-Tetrachloroethane	NA	0.43 µg/L

Example

Well Number →

AP-3871						
Sample Dates:	Aug-02	Jul-03	Aug-04	Oct-04	May-05	Oct-06
GW Elevation:	181.08	182.37	180.93	182.15	184.51	188.12
Analysis Performed						
Analytes						
	Method SW 8260B					
Carbon tetrachloride	0.48J	0.32J	0.52J	ND (1.0)	ND (1.0)	0.840J
Chloroform	3.6	ND (0.08)	3.26	2.70	3.00	2.92
Methylene chloride	0.51J	ND (0.18)	ND (5.0)B	ND (5.0)	ND (5.0)	ND (5.0)

← Sampling Date

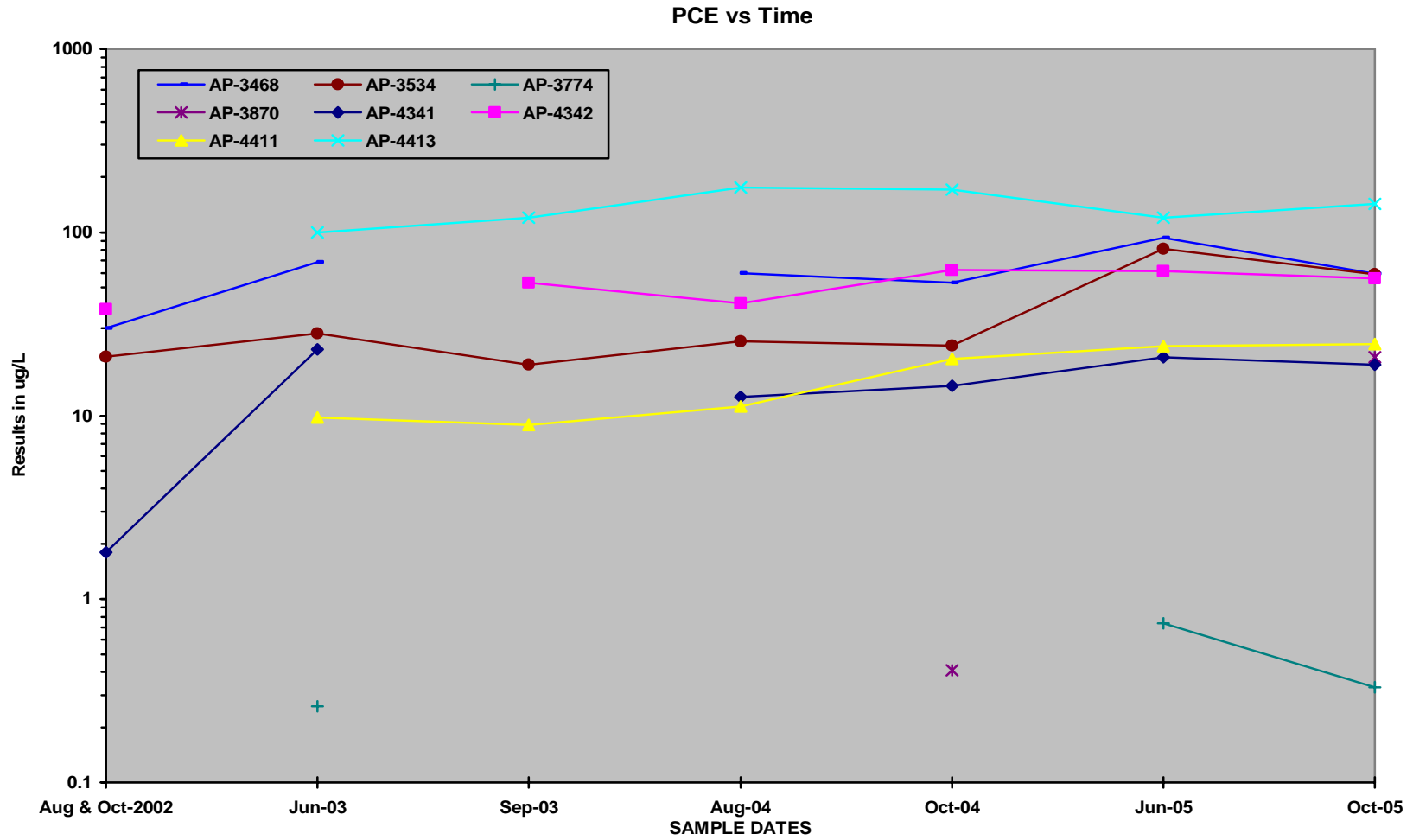
← Analysis Performed

Analyte with sample concentration →

**Figure 5-1
 OUE-AVMA
 GIS Figure**

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Figure 5-2 PCE vs. Time



Highest value taken for wells sampled twice during Aug-Oct 2002. No sampling occurred for AP-3468 and AP-4341 during Sep-2003.

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6.0 CONCLUSIONS

The 2005 OUE-AVMA data shows an increase in PCE concentrations near the center of the shallow unconfined source area well AP-4413. AP-3534, AP-4342, and AP-3468 experienced decreases in PCE in the area north of the contaminant source. AP-4411 exhibited an increase in PCE once again. This well has historically increased overall since June 2003. This well has been added to within the estimated plume boundary. All sentinel wells had no detections for PCE in October 2005.

Well AP-3893 showed no evidence of the CoC, dibenzo (a,h) anthracene. MNA sheets located in Attachment 1 suggest inadequate evidence for biodegradation of chlorinated organics for all wells.

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FINAL REPORT
FORT RICHARDSON
OUE-AVMA

ATTACHMENT 1: NATURAL ATTENUATION
SCREENING
FORT RICHARDSON, ALASKA

PREPARED FOR:



U.S. Army, Directorate of Public Works
Contract No. W911KB-04-P-0091

June 2006



US Army
Installation Management Agency



US Army Corps
of Engineers®
Alaska District



Satori Group, Inc.
1310 E. 66th Ave., #2
Anchorage, AK 99518

2005 October OUE MNA Tables

AP-3871		
Analyte	October-05	Points Awarded
Dissolved Oxygen (mg/L)	7.05	-3
Nitrate-Nitrite (mg/L)	1.93	0
Iron (II) (mg/L)	ND (1.0)	0
Sulfate (mg/L)	22.2	0
Methane (mg/L)	ND (0.005)	0
ORP (mV)	145.1	0
PCE (released) (ug/L)	ND (1.0)	NA
TCE (released) (ug/L)	ND (1.0)	NA
DCE (daughter) (ug/L)		
cis-1,2-Dichloroethene	ND (1.0)	NA
trans-1,2-Dichloroethene	ND (1.0)	NA
1,1-Dichloroethene	ND (1.0)	NA
DCE Total	0	0
Ethene/Ethane (mg/L)	ND (0.01)	0
VC (daughter) (ug/L)	ND (1.0)	0
Total MNA Score		-3

PQL value for Ethene/Ethane was determined by the sum of individual PQLs

2005 October OUE MNA Tables

AP-4413		
Analyte	October-05	Points Awarded
Dissolved Oxygen (mg/L)	BA	0
Nitrate-Nitrite (mg/L)	3.47	0
Iron (II) (mg/L)	ND (1.0)	0
Sulfate (mg/L)	23.9	0
Methane (mg/L)	ND (0.005)	0
ORP (mV)	BA	0
PCE (released) (ug/L)	143	NA
TCE (released) (ug/L)	ND (1.0)	NA
DCE (daughter) (ug/L)		
cis-1,2-Dichloroethene	ND (1.0)	NA
trans-1,2-Dichloroethene	ND (1.0)	NA
1,1-Dichloroethene	ND (1.0)	NA
DCE Total	0	0
Ethene/Ethane (mg/L)	ND (0.01)	0
VC (daughter) (ug/L)	ND (1.0)	0
Total MNA Score		0

PQL value for Ethene/Ethane was determined by the sum of individual PQLs

BA =Bailer used to sample well

2005 October OUE MNA Tables

AP-4341		
Analyte	October-05	Points Awarded
Dissolved Oxygen (mg/L)	BA	0
Nitrate-Nitrite (mg/L)	3.31	0
Iron (II) (mg/L)	ND (1.0)	0
Sulfate (mg/L)	22	0
Methane (mg/L)	ND (0.005)	0
ORP (mV)	BA	0
PCE (released) (ug/L)	19	NA
TCE (released) (ug/L)	ND (1.0)	NA
DCE (daughter) (ug/L)		
cis-1,2-Dichloroethene	ND (1.0)	NA
trans-1,2-Dichloroethene	ND (1.0)	NA
1,1-Dichloroethene	ND (1.0)	NA
DCE Total	0	0
Ethene/Ethane (mg/L)	ND (0.01)	0
VC (daughter) (ug/L)	ND (1.0)	0
Total MNA Score		0

PQL value for Ethene/Ethane was determined by the sum of individual PQLs

BA =Bailer used to sample well

2005 October OUE MNA Tables

AP-4411		
Analyte	October-05	Points Awarded
Dissolved Oxygen (mg/L)	7.75	-3
Nitrate-Nitrite (mg/L)	1.38	0
Iron (II) (mg/L)	ND (1.0)	0
Sulfate (mg/L)	16.4	2
Methane (mg/L)	ND (0.005)	0
ORP (mV)	219.8	0
PCE (released) (ug/L)	24.6	NA
TCE (released) (ug/L)	ND (1.0)	0
DCE (daughter) (ug/L)		
cis-1,2-Dichloroethene	ND (1.0)	NA
trans-1,2-Dichloroethene	ND (1.0)	NA
1,1-Dichloroethene	ND (1.0)	NA
DCE Total	0	0
Ethene/Ethane (mg/L)	ND (0.01)	0
VC (daughter) (ug/L)	ND (1.0)	0
Total MNA Score		-1

PQL value for Ethene/Ethane was determined by the sum of individual PQLs

2005 October OUE MNA Tables

AP-3870		
Analyte	October-05	Points Awarded
Dissolved Oxygen (mg/L)	7.42	-3
Nitrate-Nitrite (mg/L)	2.01	0
Iron (II) (mg/L)	ND (1.0)	0
Sulfate (mg/L)	23.1	0
Methane (mg/L)	ND (0.005)	0
ORP (mV)	179.2	0
PCE (released) (ug/L)	ND (1.0)	NA
TCE (released) (ug/L)	ND (1.0)	0
DCE (daughter) (ug/L)		
cis-1,2-Dichloroethene	ND (1.0)	NA
trans-1,2-Dichloroethene	ND (1.0)	NA
1,1-Dichloroethene	ND (1.0)	NA
DCE Total	0	0
Ethene/Ethane (mg/L)	ND (0.01)	0
VC (daughter) (ug/L)	ND (1.0)	0
Total MNA Score		-3

PQL value for Ethene/Ethane was determined by the sum of individual PQLs

2005 October OUE MNA Tables

AP-3534		
Analyte	October-05	Points Awarded
Dissolved Oxygen (mg/L)	3.55	-3
Nitrate-Nitrite (mg/L)	2.68	0
Iron (II) (mg/L)	ND (1.0)	0
Sulfate (mg/L)	23.3	0
Methane (mg/L)	ND (0.005)	0
ORP (mV)	142.9	0
PCE (released) (ug/L)	59.1	NA
TCE (released) (ug/L)	ND (1.0)	0
DCE (daughter) (ug/L)		
cis-1,2-Dichloroethene	ND (1.0)	NA
trans-1,2-Dichloroethene	ND (1.0)	NA
1,1-Dichloroethene	ND (1.0)	NA
DCE Total	0	0
Ethene/Ethane (mg/L)	ND (0.01)	0
VC (daughter) (ug/L)	ND (1.0)	0
Total MNA Score		-3

PQL value for Ethene/Ethane was determined by the sum of individual PQLs

2005 October OUE MNA Tables

AP-3468		
Analyte	October-05	Points Awarded
Dissolved Oxygen (mg/L)	6.91	-3
Nitrate-Nitrite (mg/L)	2.89	0
Iron (II) (mg/L)	ND (1.0)	0
Sulfate (mg/L)	25	0
Methane (mg/L)	ND (0.005)	0
ORP (mV)	130.5	0
PCE (released) (ug/L)	59.4	NA
TCE (released) (ug/L)	ND (1.0)	NA
DCE (daughter) (ug/L)		
cis-1,2-Dichloroethene	ND (1.0)	NA
trans-1,2-Dichloroethene	ND (1.0)	NA
1,1-Dichloroethene	ND (1.0)	NA
DCE Total	0	0
Ethene/Ethane (mg/L)	ND (0.01)	0
VC (daughter) (ug/L)	ND (1.0)	0
Total MNA Score		-3

PQL value for Ethene/Ethane was determined by the sum of individual PQLs

2005 October OUE MNA Tables

AP-3893		
Analyte	October-05	Points Awarded
Dissolved Oxygen (mg/L)	2.4	-3
Nitrate-Nitrite (mg/L)	0.144J+	2
Iron (II) (mg/L)	ND (1.0)	0
Sulfate (mg/L)	18.5	2
Methane (mg/L)	ND (0.005)	0
ORP (mV)	-13.5	1
PCE (released) (ug/L)	ND (1.0)	NA
TCE (released) (ug/L)	ND (1.0)	0
DCE (daughter) (ug/L)		
cis-1,2-Dichloroethene	ND (1.0)	NA
trans-1,2-Dichloroethene	ND (1.0)	NA
1,1-Dichloroethene	ND (1.0)	NA
DCE Total	0	0
Ethene/Ethane (mg/L)	ND (0.01)	0
VC (daughter) (ug/L)	ND (1.0)	0
Total MNA Score		0

PQL value for Ethene/Ethane was determined by the sum of individual PQLs

2005 October OUE MNA Tables

AP-4342		
Analyte	October-05	Points Awarded
Dissolved Oxygen (mg/L)	BA	0
Nitrate-Nitrite (mg/L)	3.02	0
Iron (II) (mg/L)	ND (1.0)	0
Sulfate (mg/L)	22.4	0
Methane (mg/L)	ND (0.005)	0
ORP (mV)	BA	0
PCE (released) (ug/L)	55.9	NA
TCE (released) (ug/L)	ND (1.0)	0
DCE (daughter) (ug/L)		
cis-1,2-Dichloroethene	ND (1.0)	NA
trans-1,2-Dichloroethene	ND (1.0)	NA
1,1-Dichloroethene	ND (1.0)	NA
DCE Total	0	0
Ethene/Ethane (mg/L)	ND (0.01)	0
VC (daughter) (ug/L)	ND (1.0)	0
Total MNA Score		0

BA =Bailer used to sample well
 J- = Analyte is present, but value
 may not be accurate or precise
 (estimated low)

PQL value for Ethene/Ethane was determined by the sum of individual PQLs

2005 October OUE MNA Tables

AP-3774		
Analyte	October-05	Points Awarded
Dissolved Oxygen (mg/L)	6.32	-3
Nitrate-Nitrite (mg/L)	1.84	0
Iron (II) (mg/L)	ND (1.0)	0
Sulfate (mg/L)	25.6	0
Methane (mg/L)	ND (0.005)	0
ORP (mV)	117.4	0
PCE (released) (ug/L)	0.330J+	NA
TCE (released) (ug/L)	0.710J	NA
DCE (daughter) (ug/L)		
cis-1,2-Dichloroethene	ND (1.0)	NA
trans-1,2-Dichloroethene	ND (1.0)	NA
1,1-Dichloroethene	ND (1.0)	NA
DCE Total	0	0
Ethene/Ethane (mg/L)	ND (0.01)	0
VC (daughter) (ug/L)	ND (1.0)	0
Total MNA Score		-3

PQL value for Ethene/Ethane was determined by the sum of individual PQLs

FINAL REPORT
FORT RICHARDSON
OUE-AVMA

APPENDIX A: LOW FLOW SAMPLING
FORMS

FORT RICHARDSON, ALASKA

PREPARED FOR:



U.S. Army, Directorate of Public Works
Contract No. W911KB-04-P-0091

June 2006



US Army
Installation Management Agency



US Army Corps
of Engineers®
Alaska District



Satori Group, Inc.
1510 E. 66th Ave., #2
Anchorage, AK 99518



Well ID: AP-3871

Low-Flow Groundwater Sampling with Minimal Drawdown

Project: Ft. Richardson Groundwater Sampling Date: 10/18/05
 Project #: USACE Project No: #06-00250U2E Start Time: 945
 Field Team: D. Lucas / R. Pohl End Time: 1035
 Sample ID: 0510FRDWA-01 Time: 1035 primary dup triplicate ms/msd
 Sample ID: _____ Time: _____ primary dup triplicate ms/msd
 Sample ID: _____ Time: _____ primary dup triplicate ms/msd

Weather Conditions: Cloudy, light rain, light wind, 36°F

Depth to Top of Product (FTOC): 0 Depth to Water (FTOC): 106.34
 Depth to Oil/Water Interface (FTOC): _____ Total Depth (FTOC): 121.10

Flow Rate 100 ml Low Flow Rate: 0.1 Liter/min., increasing flow rate is permissible

Criteria for Stable Parameters as long as drawdown requirements are met.

Parameter	Working Range	Stability Criteria	Notes
Temperature	>0.00 °C	± 0.5 °C	ideally < 6 °C
pH	0-14	± 0.2	
Conductivity	0-9.99 S/m	± 3%	or ± 0.02 Sm
ORP	± 1999 mV	± 10%	or ± 2 mV
Dissolved Oxygen	0-19.99 mg/L	± 10%	or ± 0.02 mg/L
Turbidity	0-800 NTU	± 10%	or ± 10 NTU

Sensory Observations

Color: Clear, Amber, Tan, Brown, Grey, Milky White, Other:
 Odor: None, Low, Medium, High, Very Strong, H₂S, Fuel Like, Chemical ?, Unknown
 Turbidity: None, Low, Medium, High, Very Turbid, Heavy Silts

Instrument Observations

Round	Time	Temp °C	pH	Conductivity (S/m)	Turbidity y	DO (mg/L)	Color	Odor	ORP (mV)	Water Level (ft BTOC)	Draw-down
1	945	6.46	8.66	293	5.00	12.35	clear	none	158.5	106.34	0
2	950	6.42	8.39	259	3.43	12.53	clear	none	156.9	106.35	-0.01
3	953	6.01	7.99	334	2.24	12.12	clear	none	174.0	106.35	-0.01
4	1000	5.99	7.90	366	1.36	10.85	clear	none	171.1	106.35	-0.01
5	1005	5.99	7.88	385	.74	8.46	clear	none	168.2	106.35	-0.01
6	1010	6.00	7.98	407	.53	9.00	clear	none	161.6	106.35	-0.01
7	1015	6.01	7.95	415	.45	7.35	clear	none	158.8	106.34	0
8	1020	6.02	7.98	417	.75	7.22	clear	none	155.8	106.34	0
9	1025	6.02	8.01	417	.56	7.10	clear	none	151.5	106.34	0
10	1030	6.04	8.03	418	.63	7.12	clear	none	148.8	106.34	0
11	1035	6.07	8.06	418	.58	7.05	clear	none	145.1	106.34	0
12											

Notes:
 Drawdown should be less than 0.3 feet from the original depth to groundwater for each event.
 Minimal draw-down shall be achieved and measured by: 1) pumping at a low rate (approximately 1 liter/ 3 minutes and 2) continually measuring water levels in the well.

Comments

Well in good condition. Total Depth = 121.10. Vol = 1.5 gal.
 No drawdown.



Well ID: AP 377A

Low-Flow Groundwater Sampling with Minimal Drawdown

Project: Ft. Richardson Groundwater Sampling Date: 10/18/05
 Project #: USACE Project No: #06-005 FTR OUE (AVMA) Start Time: 11:40
 Field Team: D. Lucas / R. Pohl End Time: 12:30
 Sample ID: 0510FROAWA-2 Time: 12:30 primary dup triplicate ms/msd
 Sample ID: _____ Time: _____ primary dup triplicate ms/msd
 Sample ID: _____ Time: _____ primary dup triplicate ms/msd

Weather Conditions: Cloudy, 37°F

Depth to Top of Product (FTOC): 0 Depth to Water (FTOC): 102.52
 Depth to Oil/Water Interface (FTOC): _____ Total Depth (FTOC): 117.60

Flow Rate: 100 ml Low Flow Rate: 0.1 Liter/min., increasing flow rate is permissible

Criteria for Stable Parameters as long as drawdown requirements are met.

Parameter	Working Range	Stability Criteria	Notes
Temperature	>0.00 °C	± 0.5 °C	ideally < 6 °C
pH	0-14	± 0.2	
Conductivity	0-9.99 S/m	± 3%	or ± 0.02 Sm
ORP	± 1999 mV	± 10%	or ± 2 mV
Dissolved Oxygen	0-19.99 mg/L	± 10%	or ± 0.02 mg/L
Turbidity	0-800 NTU	± 10%	or ± 10 NTU

Sensory Observations

Color: Clear, Amber, Tan, Brown, Grey, Milky White, Other:
 Odor: None, Low, Medium, High, Very Strong, H₂S, Fuel Like, Chemical ?, Unknown
 Turbidity: None, Low, Medium, High, Very Turbid, Heavy Silts

Instrument Observations

Round	Time	Temp °C	pH	Conductivity (S/m)	Turbidity y	DO (mg/L)	Color	Odor	ORP (mV)	Water Level (ft BTOC)	Draw-down
1	1140	5.98	8.83	193	5.00	15.77	clear	none	240.6	102.52	0
2	1145	5.88	8.56	259	5.35	13.12	clear	none	220.3	102.52	0
3	1150	6.05	8.34	333	3.47	10.59	clear	none	194.1	102.52	0
4	1155	6.10	8.31	367	1.37	8.5	clear	none	174.1	102.52	0
5	1200	6.06	8.31	393	.96	7.47	clear	none	160.9	102.52	0
6	1205	6.06	8.31	408	.97	6.88	clear	none	148.6	102.52	1.01
7	1210	6.02	8.31	418	1.12	6.70	clear	none	140.8	102.52	0
8	1215	6.07	8.32	421	.85	6.58	clear	none	132.1	102.52	0
9	1220	6.08	8.32	422	.69	6.52	clear	none	126.6	102.52	0
10	1225	6.13	8.32	423	.61	6.36	clear	none	122.7	102.52	0
11	1230	6.17	8.31	423	.63	6.32	clear	none	117.4	102.52	0
12											

Notes:

Drawdown should be less than 0.3 feet from the original depth to groundwater for each event.
 Minimal draw-down shall be achieved and measured by: 1) pumping at a low rate (approximately 1 liter/ 3 minutes and 2) continually measuring water levels in the well.

Comments

Well in good condition. Total depth = 117.60. Vol. = 2.5 gal.
 No Drawdown, good recharge.



Well ID: AP-3893

Low-Flow Groundwater Sampling with Minimal Drawdown

Project: Ft. Richardson Groundwater Sampling Date: 10/18/05
 Project #: USACE Project No: #06-005 FTR OUE (AVMH) Start Time: 1355
 Field Team: D. Lucas / R. Pohl End Time: 1530
 Sample ID: 0510FROAWA-3 Time: 1530 (primary) dup triplicate ms/msd
 Sample ID: _____ Time: _____ primary dup triplicate ms/msd
 Sample ID: _____ Time: _____ primary dup triplicate ms/msd
 Weather Conditions: Sunny, 40°F

Depth to Top of Product (FTOC): 0 Depth to Water (FTOC): 87.36
 Depth to Oil/Water Interface (FTOC): _____ Total Depth (FTOC): 125.60

Flow Rate: 100 mL Low Flow Rate: 0.1 Liter/min., increasing flow rate is permissible

Criteria for Stable Parameters as long as drawdown requirements are met.

Parameter	Working Range	Stability Criteria	Notes
Temperature	>0.00 °C	± 0.5 °C	ideally < 6 °C
pH	0-14	± 0.2	
Conductivity	0-9.99 S/m	± 3%	or ± 0.02 Sm
ORP	± 1999 mV	± 10%	or ± 2 mV
Dissolved Oxygen	0-19.99 mg/L	± 10%	or ± 0.02 mg/L
Turbidity	0-800 NTU	± 10%	or ± 10 NTU

Sensory Observations

Color: Clear Amber, Tan, Brown, Grey, Milky White, Other:
 Odor: None Low, Medium, High, Very Strong, H₂S, Fuel Like, Chemical ?, Unknown
 Turbidity: None Low, Medium, High, Very Turbid, Heavy Silts

Instrument Observations

Round	Time	Temp °C	pH	Conductivity (S/m)	Turbidity y	DO (mg/L)	Color	Odor	ORP (mV)	Water Level (ft BTOC)	Draw-down
1	1355	7.60	9.07	205	.91	4.12	clear	none	79.1	87.40	-.04
2	1400	7.32	9.23	201	.50	3.48	clear	none	55.6	87.40	-.04
3	1405	7.37	9.25	202	.42	3.03	clear	none	50.3	87.40	-.04
4	1410	7.45	9.21	202	.37	3.30	clear	none	43.9	87.39	-.03
5	1415	7.35	9.20	201	.36	3.25	clear	none	29.0	87.40	-.04
6	1420	7.29	9.20	201	.31	3.03	clear	none	18.8	87.40	-.04
7	1425	7.29	8.45	201	.27	4.01	clear	none	44.7	87.40	-.04
8	1430	7.25	9.08	200	.29	3.06	clear	none	13.7	87.40	-.04
9	1435	7.28	9.12	200	.27	2.92	clear	none	8.9	87.40	-.04
10	1440	7.30	9.12	201	.25	2.85	clear	none	5.1	87.40	-.04
11	1445	7.30	9.11	201	.30	2.85	clear	none	2.6	87.40	-.04
12	1450	7.25	9.09	200	.26	2.78	clear	none	-0.9	87.40	-.04

Notes:
 Drawdown should be less than 0.3 feet from the original depth to groundwater for each event.
 Minimal draw-down shall be achieved and measured by: 1) pumping at a low rate (approximately 1 liter/ 3 minutes and 2) continually measuring water levels in the well.

Comments

Well in good condition. Total Depth = 125.60. Vol = ~4.5 gal.
 Continued next page. ORP slow to stabilize. Good Recharge.



Well ID: 3993 (continued)

Low-Flow Groundwater Sampling with Minimal Drawdown

Project: Ft. Richardson Groundwater Sampling Date: 10/18/05
 Project #: USACE Project No: #06-005 FTR OUE (AVMH) Start Time: 1455 (RA) 1355
 Field Team: D. Lucas / R. Pol End Time: 1730
 Sample ID: 0510 FROE RP Time: 1530 (primary) dup triplicate ms/msd
 Sample ID: 0510 FR ORWA-3 (continued) Time: _____ primary dup triplicate ms/msd
 Sample ID: _____ Time: _____ primary dup triplicate ms/msd

Weather Conditions: Sunny 40°C

Depth to Top of Product (FTOC): _____ Depth to Water (FTOC): 87.36
 Depth to Oil/Water Interface (FTOC): _____ Total Depth (FTOC): 125-60

Flow Rate: 160 Low Flow Rate: 0.1 Liter/min., increasing flow rate is permissible

Criteria for Stable Parameters as long as drawdown requirements are met.

Parameter	Working Range	Stability Criteria	Notes
Temperature	>0.00 °C	± 0.5 °C	ideally < 6 °C
pH	0-14	± 0.2	
Conductivity	0-9.99 S/m	± 3%	or ± 0.02 Sm
ORP	± 1999 mV	± 10%	or ± 2 mV
Dissolved Oxygen	0-19.99 mg/L	± 10%	or ± 0.02 mg/L
Turbidity	0-800 NTU	± 10%	or ± 10 NTU

Sensory Observations

Color: Clear Amber, Tan, Brown, Grey, Milky White, Other:
 Odor: None Low, Medium, High, Very Strong, H₂S, Fuel Like, Chemical ?, Unknown
 Turbidity: None Low, Medium, High, Very Turbid, Heavy Silts

Instrument Observations

Round	Time	Temp °C	pH	Conductivity (S/m)	Turbidity y	DO (mg/L)	Color	Odor	ORP (mV)	Water Level (ft BTOC)	Draw-down
1	1455	7.21	9.08	200	.22	2.70	clear	none	-2.3	87.41	-.05
2	1500	7.18	9.05	200	.33	2.70	clear	none	-4.4	87.40	-.04
3	1505	7.18	9.04	200	.72	2.59	clear	none	-7.2	87.46	-.04
4	1516	7.20	9.03	200	.50	2.51	clear	none	-9.2	87.40	-.04
5	1515	7.21	9.02	200	.41	2.48	clear	none	-11.1	87.40	-.04
6	1524	7.22	9.00	200	.39	2.43	clear	none	-12.6	87.40	-.04
7	1525	7.22	9.00	200	.38	2.42	clear	none	-13.0	87.40	-.04
8	1530	7.22	9.00	200	.35	2.40	clear	none	-13.5	87.40	-.04
9											
10											
11											
12											

Notes:
 Drawdown should be less than 0.3 feet from the original depth to groundwater for each event.
 Minimal draw-down shall be achieved and measured by: 1) pumping at a low rate (approximately 1 liter/ 3 minutes and 2) continually measuring water levels in the well.

Comments

(cont) pg 2 of 2

Well ID: AP 3468**Low-Flow Groundwater Sampling with Minimal Drawdown**

Project: Ft. Richardson Groundwater Sampling Date: 6/18/05
 Project #: USACE Project No: #06-005 FTR OUE (AVMH) Start Time: 1620
 Field Team: D. Lucas / R. Pahl End Time: 1700
 Sample ID: 0510FROUWA-4 Time: 1700 (primary) dup triplicate ms/msd
 Sample ID: _____ Time: _____ primary dup triplicate ms/msd
 Sample ID: _____ Time: _____ primary dup triplicate ms/msd

Weather Conditions: Ptly cloudy, Wind, 38°F

Depth to Top of Product (FTOC): 0 Depth to Water (FTOC): 105.98
 Depth to Oil/Water Interface (FTOC): _____ Total Depth (FTOC): 115.90

Flow Rate: 100 mL Low Flow Rate: 0.1 Liter/min., increasing flow rate is permissible**Criteria for Stable Parameters** as long as drawdown requirements are met.

Parameter	Working Range	Stability Criteria	Notes
Temperature	>0.00 °C	± 0.5 °C	ideally < 6 °C
pH	0-14	± 0.2	
Conductivity	0-9.99 S/m	± 3%	or ± 0.02 Sm
ORP	± 1999 mV	± 10%	or ± 2 mV
Dissolved Oxygen	0-19.99 mg/L	± 10%	or ± 0.02 mg/L
Turbidity	0-800 NTU	± 10%	or ± 10 NTU

Sensory Observations

Color: Clear, Amber, Tan, Brown, Grey, Milky White Other:
 Odor: None Low, Medium, High, Very Strong, H₂S, Fuel Like, Chemical ?, Unknown
 Turbidity: None Low, Medium, High, Very Turbid, Heavy Silts

Instrument Observations

Round	Time	Temp °C	pH	Conductivity (S/m)	Turbidity y	DO (mg/L)	Color	Odor	ORP (mV)	Water Level (ft BTOC)	Draw-down
1	<u>1620</u>	<u>7.07</u>	<u>8.28</u>	<u>250</u>	<u>9.99</u>	<u>14.33</u>	<u>M.WHT</u>	<u>NO</u>	<u>118.4</u>	<u>105.99</u>	<u>-0.01</u>
2	<u>1625</u>	<u>6.83</u>	<u>8.21</u>	<u>308</u>	<u>9.99</u>	<u>10.95</u>	<u>M.WHT</u>	<u>NO</u>	<u>117.0</u>	<u>105.99</u>	<u>-0.01</u>
3	<u>1630</u>	<u>6.71</u>	<u>8.10</u>	<u>352</u>	<u>9.99</u>	<u>7.57</u>	<u>M.WHT</u>	<u>NO</u>	<u>113.8</u>	<u>105.99</u>	<u>-0.01</u>
4	<u>1635</u>	<u>6.60</u>	<u>8.10</u>	<u>364</u>	<u>9.99</u>	<u>7.32</u>	<u>M.WHT</u>	<u>NO</u>	<u>110.3</u>	<u>105.99</u>	<u>-0.01</u>
5	<u>1640</u>	<u>6.48</u>	<u>8.10</u>	<u>377</u>	<u>9.99</u>	<u>7.16</u>	<u>M.WHT</u>	<u>NO</u>	<u>112.6</u>	<u>105.99</u>	<u>-0.01</u>
6	<u>1645</u>	<u>6.48</u>	<u>8.08</u>	<u>381</u>	<u>9.99</u>	<u>7.15</u>	<u>M.WHT</u>	<u>NO</u>	<u>114.6</u>	<u>105.99</u>	<u>-0.01</u>
7	<u>1650</u>	<u>6.51</u>	<u>8.06</u>	<u>388</u>	<u>9.99</u>	<u>7.07</u>	<u>M.WHT</u>	<u>NO</u>	<u>120.9</u>	<u>106.00</u>	<u>-0.02</u>
8	<u>1655</u>	<u>6.71</u>	<u>8.03</u>	<u>392.842 (RP)</u>	<u>9.99</u>	<u>6.98</u>	<u>M.WHT</u>	<u>NO</u>	<u>128.8</u>	<u>106.00</u>	<u>-0.02</u>
9	<u>1700</u>	<u>6.73</u>	<u>8.00</u>	<u>395</u>	<u>9.99</u>	<u>6.91</u>	<u>M.WHT</u>	<u>NO</u>	<u>130.5</u>	<u>106.00</u>	<u>-0.02</u>
10											
11											
12											

Notes:

Drawdown should be less than 0.3 feet from the original depth to groundwater for each event.
 Minimal draw-down shall be achieved and measured by: 1) pumping at a low rate (approximately 1 liter/ 3 minutes and 2) continually measuring water levels in the well.

Comments

Well in good condition. Good Recharge. Total Depth = 115.90 .
Vol. = ~ 2.50 gal.



Well ID: AP-3534

Low-Flow Groundwater Sampling with Minimal Drawdown

Project:	Ft. Richardson Groundwater Sampling			Date:	10/18/05
Project #:	USACE Project No: #06-005 FTR OUE (AVMH)			Start Time:	1735
Field Team:	D. Lucas / R. Pohl			End Time:	1815
Sample ID:	0510FRORWA-5	Time:	1815 (primary)	dup	triplicate ms/msd
Sample ID:		Time:	primary	dup	triplicate ms/msd
Sample ID:		Time:	primary	dup	triplicate ms/msd

Weather Conditions: Partly Cloudy, 37°F

Depth to Top of Product (FTOC):	<u>∅</u>	Depth to Water (FTOC):	<u>105.60</u>
Depth to Oil/Water Interface (FTOC):		Total Depth (FTOC):	<u>140.40</u>
Flow Rate	<u>100 mL</u>	Low Flow Rate: 0.1 Liter/min., increasing flow rate is permissible	

Criteria for Stable Parameters as long as drawdown requirements are met.

Parameter	Working Range	Stability Criteria	Notes
Temperature	>0.00 °C	± 0.5 °C	ideally < 6 °C
pH	0-14	± 0.2	
Conductivity	0-9.99 S/m	± 3%	or ± 0.02 Sm
ORP	± 1999 mV	± 10%	or ± 2 mV
Dissolved Oxygen	0-19.99 mg/L	± 10%	or ± 0.02 mg/L
Turbidity	0-800 NTU	± 10%	or ± 10 NTU

Sensory Observations

Color: Clear, Amber, Tan, Brown, Grey, Milky White, Other:
 Odor: None, Low, Medium, High, Very Strong, H₂S, Fuel Like, Chemical ?, Unknown
 Turbidity: None, Low, Medium, High, Very Turbid, Heavy Silts

Instrument Observations

Round	Time	Temp °C	pH	Conductivity (S/m)	Turbidity y	DO (mg/L)	Color	Odor	ORP (mV)	Water Level (ft BTOC)	Draw-down
1	1735	6.21	8.08	220	4.35	12.54	Clear	No	325.1	105.60	0
2	1740	6.52	8.26	220	2.59	11.11	Clear	No	231.3	105.60	0
3	1745	6.62	8.20	240	.80	5.46	Clear	No	195.6	105.60	0
4	1750	6.42	8.23	250	.33	4.68	Clear	No	180.1	105.60	0
5	1755	6.30	8.24	253	.21	3.84	Clear	No	165.4	105.58	+0.02
6	1800	6.23	8.23	253	.29	3.77	Clear	No	156.4	105.59	+0.01
7	1805	6.26	8.26	254	.17	3.48	Clear	No	146.0	105.59	+0.01
8	1810	6.17	8.24	256	.18	3.31	Clear	No	141.7	105.59	+0.01
9	1815	6.15	8.22	266	.20	3.55	Clear	No	142.9	105.59	+0.01
10											
11											
12											

Notes:
 Drawdown should be less than 0.3 feet from the original depth to groundwater for each event.
 Minimal draw-down shall be achieved and measured by: 1) pumping at a low rate (approximately 1 liter/ 3 minutes and 2) continually measuring water levels in the well.

Comments

Well in good condition. Total Depth = 140.40 . Vol = ~ 2.0 gal.
 Good recharge.



Well ID: AP-3870

Low-Flow Groundwater Sampling with Minimal Drawdown

Project: Ft. Richardson Groundwater Sampling Date: 10/19/05
 Project #: USACE Project No: #06-005 FTR OUE (AVMH) Start Time: 1151
 Field Team: D. Lucas / R. Pohn End Time: 1155
 Sample ID: 0510FROAWA-6 Time: 1155 (primary) dup triplicate ms/msd
 Sample ID: 0510FROAWA-7 Time: 1125 primary (dup) triplicate ms/msd
 Sample ID: _____ Time: _____ primary dup triplicate ms/msd

Weather Conditions: partly cloudy, light wind, 42°F

Depth to Top of Product (FTOC): 0 Depth to Water (FTOC): 95.29
 Depth to Oil/Water Interface (FTOC): _____ Total Depth (FTOC): 110.70

Flow Rate: 100 Low Flow Rate: 0.1 Liter/min., increasing flow rate is permissible

Criteria for Stable Parameters as long as drawdown requirements are met.

Parameter	Working Range	Stability Criteria	Notes
Temperature	>0.00 °C	± 0.5 °C	ideally < 6 °C
pH	0-14	± 0.2	
Conductivity	0-9.99 S/m	± 3%	or ± 0.02 Sm
ORP	± 1999 mV	± 10%	or ± 2 mV
Dissolved Oxygen	0-19.99 mg/L	± 10%	or ± 0.02 mg/L
Turbidity	0-800 NTU	± 10%	or ± 10 NTU

Sensory Observations

Color: (Clear) Amber, Tan, Brown, Grey, Milky White, Other:
 Odor: None Low, Medium, High, Very Strong, H₂S, Fuel Like, Chemical ?, Unknown
 Turbidity: None, (Low) Medium, High, Very Turbid, Heavy Silts

Instrument Observations

Round	Time	Temp °C	pH	Conductivity (S/m)	Turbidity	DO (mg/L)	Color	Odor	ORP (mV)	Water Level (ft BTOC)	Draw-down
1	1115	7.67	7.57	447	9.99	7.66	Clear	No	175.4	95.29	0
2	1120	7.85	7.57	451	9.99	7.61	Clear	No	180.5	95.29	0
3	1125	8.12	7.57	455	9.99	7.47	Clear	No	183.1	95.29	0
4	1130	8.28	7.57	458	9.99	7.54	Clear	No	184.4	95.29	0
5	1135	8.46	7.61	459	9.99	8.46	Clear	No	191.7	95.29	0
6	1140	8.48	7.59	461	9.99	7.47	clear	No	183.4	95.29	0
7	1145	8.54	7.61	462	6.59	7.38	clear	No	181.1	95.29	0
8	1150	8.50	7.60	462	5.92	7.46	Clear	No	177.1	95.29	0
9	1155	8.63	7.57	463	5.98	7.42	Clear	No	179.2	95.29	0
10											
11											
12											

Notes:
 Drawdown should be less than 0.3 feet from the original depth to groundwater for each event.
 Minimal draw-down shall be achieved and measured by: 1) pumping at a low rate (approximately 1 liter/ 3 minutes and 2) continually measuring water levels in the well.

Comments

Well in good condition. Total Depth = 110.70. Vol = ~ 3.4 gal.
 CRREL device removed & replaced. Good recharge.
 MS/MSD. Fictitious Well AP-3888.



Well ID: AD-4411

Low-Flow Groundwater Sampling with Minimal Drawdown

Project: Ft. Richardson Groundwater Sampling Date: 10/19/05
 Project #: USACE Project No: #06-005 FTR OUE (AVMH) Start Time: 1415
 Field Team: D. Lucas / R. Pohl End Time: 1440
 Sample ID: 0510FR0A WA-08 Time: 1440 primary dup triplicate ms/msd
 Sample ID: 0510FR0A WA-09 Time: 1705 primary dup triplicate ms/msd *E. Ruse*
 Sample ID: _____ Time: _____ primary dup triplicate ms/msd

Weather Conditions: Windy, cloudy, 43°F

Depth to Top of Product (FTOC): ∅ Depth to Water (FTOC): 67.49
 Depth to Oil/Water Interface (FTOC): _____ Total Depth (FTOC): 72.80

Flow Rate: 50 mL Low Flow Rate: 0.1 Liter/min., increasing flow rate is permissible

Criteria for Stable Parameters as long as drawdown requirements are met.

Parameter	Working Range	Stability Criteria	Notes
Temperature	>0.00 °C	± 0.5 °C	ideally < 6 °C
pH	0-14	± 0.2	
Conductivity	0-9.99 S/m	± 3%	or ± 0.02 Sm
ORP	± 1999 mV	± 10%	or ± 2 mV
Dissolved Oxygen	0-19.99 mg/L	± 10%	or ± 0.02 mg/L
Turbidity	0-800 NTU	± 10%	or ± 10 NTU

Sensory Observations

Color: Clear, Amber, Tan, Brown, Grey, Milky White Other:
 Odor: None Low, Medium, High, Very Strong, H₂S, Fuel Like, Chemical ?, Unknown
 Turbidity: None, Low, Medium High, Very Turbid, Heavy Silts

Instrument Observations

Round	Time	Temp °C	pH	Conductivity (S/m)	Turbidity y	DO (mg/L)	Color	Odor	ORP (mV)	Water Level (ft BTOC)	Draw-down
1	1415	11.14	8.25	310	9.99	10.84	M.WHT	NO	275.2	68.15	-0.66
2	1420	10.93	7.78	414	9.99	9.43	M.WHT	NO	249.0	68.20	-0.71
3	1425	10.63 11.13	7.62	464	9.99	8.02	M.WHT	NO	236.2	68.25	-0.76
4	1430	11.77	7.59	483	9.99	7.86	M.WHT	NO	230.9	68.29	-0.80
5	1435	11.85	7.58	495	9.99	7.51	M.WHT	NO	224.5	68.28	-0.79
6	1440	11.52	7.57	503	9.99	7.75	M.WHT	NO	219.8	68.42	-0.93
7											
8											
9											
10											
11											
12											

Notes:
 Drawdown should be less than 0.3 feet from the original depth to groundwater for each event.
 Minimal draw-down shall be achieved and measured by: 1) pumping at a low rate (approximately 1 liter/ 3 minutes and 2) continually measuring water levels in the well.

Comments

Well in good condition. Total Depth = 72.80. Vol = ~0.3 gal.
 Slow Recharge. flow adjusted to slow drawdowns.

Well ID: AP-4413**Low-Flow Groundwater Sampling with Minimal Drawdown**

Project: Ft. Richardson Groundwater Sampling
 Project #: USACE Project No: #06-005 FTR OUE (AVMH)
 Field Team: D. LUCAS / R. POHL
 Sample ID: 0510FROAWA-10 Time: 17:35 primary dup
 Sample ID: _____ Time: _____ primary dup
 Sample ID: _____ Time: _____ primary dup

Date: 10/19/05
 Start Time: 15:25
 End Time: 17:35
 triplicate ms/msd
 triplicate ms/msd
 triplicate ms/msd

Weather Conditions: PTLY SUNNY, ~40°F, WIND

Depth to Top of Product (FTOC): ∅ Depth to Water (FTOC): 72.13
 Depth to Oil/Water Interface (FTOC): _____ Total Depth (FTOC): 75.40

Flow Rate: ∅ Low Flow Rate: 0.1 Liter/min., increasing flow rate is permissible**Criteria for Stable Parameters** as long as drawdown requirements are met.

Parameter	Working Range	Stability Criteria	Notes
Temperature	>0.00 °C	± 0.5 °C	ideally < 6 °C
pH	0-14	± 0.2	
Conductivity	0-9.99 S/m	± 3%	or ± 0.02 Sm
ORP	± 1999 mV	± 10%	or ± 2 mV
Dissolved Oxygen	0-19.99 mg/L	± 10%	or ± 0.02 mg/L
Turbidity	0-800 NTU	± 10%	or ± 10 NTU

Sensory Observations

Color: Clear, Amber, Tan, Brown Grey, Milky White, Other:
 Odor: None Low, Medium, High, Very Strong, H₂S, Fuel Like, Chemical ?, Unknown
 Turbidity: None, Low, Medium, High Very Turbid, Heavy Silts

Instrument Observations

Round	Time	Temp °C	pH	Conductivity (S/m)	Turbidity	DO (mg/L)	Color	Odor	ORP (mV)	Water Level (ft-BTOC)	Draw-down
1											
2											
3											
4											
5											
6											
7											
8											
9											
10											
11											
12											

Notes:
 Drawdown should be less than 0.3 feet from the original depth to groundwater for each event.
 Minimal draw-down shall be achieved and measured by: 1) pumping at a low rate (approximately 1 liter/ 3 minutes and 2) continually measuring water levels in the well.

Comments

A Well in good condition. SWL @ sampling 72.15
 $75.40 - 72.13 = 3.27 \text{ ft} \times 0.163 = .533 \times 4 = 2.13 \text{ gal.}$



Well ID: AP-4341

Low-Flow Groundwater Sampling with Minimal Drawdown

Project: Ft. Richardson Groundwater Sampling Date: 10/19/05
 Project #: USACE Project No: #06-005 FTR OUE (AVMH) Start Time: 15:45
 Field Team: D. Lucas / R. Pohl End Time: 17:50
 Sample ID: 0510 FROAWA-11 Time: 17:50 primary dup triplicate ms/msd
 Sample ID: _____ Time: _____ primary dup triplicate ms/msd
 Sample ID: _____ Time: _____ primary dup triplicate ms/msd

Weather Conditions: PTLY SUNNY, 240°F, WIND

Depth to Top of Product (FTOC): 0 Depth to Water (FTOC): 63.97
 Depth to Oil/Water Interface (FTOC): _____ Total Depth (FTOC): 68.10

Flow Rate: 0 Low Flow Rate: 0.1 Liter/min., increasing flow rate is permissible

Criteria for Stable Parameters as long as drawdown requirements are met.

Parameter	Working Range	Stability Criteria	Notes
Temperature	>0.00 °C	± 0.5 °C	ideally < 6 °C
pH	0-14	± 0.2	
Conductivity	0-9.99 S/m	± 3%	or ± 0.02 Sm
ORP	± 1999 mV	± 10%	or ± 2 mV
Dissolved Oxygen	0-19.99 mg/L	± 10%	or ± 0.02 mg/L
Turbidity	0-800 NTU	± 10%	or ± 10 NTU

Sensory Observations

Color: Clear, Amber, Tan, Brown, Grey, Milky White, Other:
 Odor: None Low, Medium, High, Very Strong, H₂S, Fuel Like, Chemical ?, Unknown
 Turbidity: None, Low, Medium, High Very Turbid, Heavy Silts

Instrument Observations

Round	Time	Temp °C	pH	Conductivity (S/m)	Turbidity	DO (mg/L)	Color	Odor	ORP (mV)	Water Level (ft BTOC)	Draw-down
1											
2											
3											
4											
5											
6											
7											
8											
9											
10											
11											
12											

Notes:
 Drawdown should be less than 0.3 feet from the original depth to groundwater for each event.
 Minimal draw-down shall be achieved and measured by: 1) pumping at a low rate (approximately 1 liter/ 3 minutes and 2) continually measuring water levels in the well.

Comments

* Purged dry @ 15:55. • 5 gal, removed.

$$68.10 - 63.97 = 4.13 \text{ ft} \times 0.163 = .673 \times 4 = 2.70$$

Well ID: AP-4342**Low-Flow Groundwater Sampling with Minimal Drawdown**

Project: Ft. Richardson Groundwater Sampling Date: 10/19/05
 Project #: USACE Project No: #06-005 FTR OUE (AVMH) Start Time: 16:10
 Field Team: DEREK LUCAS / RAYMOND POHL End Time: 18:15
 Sample ID: 0510FROAWA-12 Time: 18:15 (primary) dup triplicate ms/msd
 Sample ID: _____ Time: _____ primary dup triplicate ms/msd
 Sample ID: _____ Time: _____ primary dup triplicate ms/msd

Weather Conditions: PTLY SUNNY, 240°F, SLIGHT WIND

Depth to Top of Product (FTOC): 0 Depth to Water (FTOC): 97.02
 Depth to Oil/Water Interface (FTOC): _____ Total Depth (FTOC): 101.90

Flow Rate: 0 Low Flow Rate: 0.1 Liter/min., increasing flow rate is permissible**Criteria for Stable Parameters** as long as drawdown requirements are met.

Parameter	Working Range	Stability Criteria	Notes
Temperature	>0.00 °C	± 0.5 °C	ideally < 6 °C
pH	0-14	± 0.2	
Conductivity	0-9.99 S/m	± 3%	or ± 0.02 Sm
ORP	± 1999 mV	± 10%	or ± 2 mV
Dissolved Oxygen	0-19.99 mg/L	± 10%	or ± 0.02 mg/L
Turbidity	0-800 NTU	± 10%	or ± 10 NTU

Sensory Observations

Color: Clear, Amber, Tan, (Brown), Grey, Milky White, Other:
 Odor: (None) Low, Medium, High, Very Strong, H₂S, Fuel Like, Chemical ?, Unknown
 Turbidity: None, Low, Medium, (High), Very Turbid, Heavy Silts

Instrument Observations

Round	Time	Temp °C	pH	Conductivity (S/m)	Turbidity	DO (mg/L)	Color	Odor	ORP (mV)	Water Level (ft BTOG)	Draw-down
1											
2											
3											
4											
5											
6											
7											
8											
9											
10											
11											
12											

Notes:
 Drawdown should be less than 0.3 feet from the original depth to groundwater for each event.
 Minimal draw-down shall be achieved and measured by: 1) pumping at a low rate (approximately 1 liter/ 3 minutes and 2) continually measuring water levels in the well.

Comments

* WELL IN GOOD CONDITION. BALLER SAMPLED.

$$101.90 - 97.02 = 3.88 \text{ ft} \times 0.163 = 0.632 \times 4 = 2.53 \text{ gal}$$

**FINAL REPORT
FORT RICHARDSON
OUE-AVMA**

**APPENDIX B: WELL DATA
SPREADSHEETS**

FORT RICHARDSON, ALASKA

PREPARED FOR:



**U.S. Army, Directorate of Public Works
Contract No. W911KB-04-P-0091**

June 2006



**US Army
Installation Management Agency**



**US Army Corps
of Engineers®
Alaska District**



**Satori Group, Inc.
1510 E. 66th Ave., #2
Anchorage, AK 99518**

Field Data

Project Data:

Contract Number:	USACE # 06-005
Project/Site Name:	OUE-AVMA
Date:	10/18/2005
Location (AP):	AP-3468
Sample ID:	0510FROAWA-04
Matrix:	WATER

Location Data:

Sample Location:		
UTM WGS84 Zone 6	<u>X Coord</u>	<u>Y Coord</u>
Meters:	149 43.000	61 15.504

Field Data (From Stabilized or Last Recording Prior to Sampling):

		<u>Units</u>
Sample Type:	PRIMARY	
Turbidity:	9.99	NTU
Free Phase Product:	NO	
Water Temperature:	6.73	Celsius
pH:	8	Standard Units
Dissolved Ox Concentrations:	6.91	mg/L
REDOX Potential:	130.5	-/+ mV
Conductivity:	395	umhos/cm
Filtered for Dissolved Metals:	YES	
Color:	MILKY WHITE	
Odor:	NONE	
Groundwater Level:	105.98	Feet MSL
Total Depth:	115.9	



Field Data

Project Data:

Contract Number:	USACE # 06-005
Project/Site Name:	OUE-AVMA
Date:	10/19/2005
Location (AP):	AP-4411
Sample ID:	0510FROAWA-09
Matrix:	WATER

Location Data:

Sample Location:		
UTM WGS84 Zone 6	<u>X Coord</u>	<u>Y Coord</u>
Meters:	149 42.806	61 15.449

Field Data (From Stabilized or Last Recording Prior to Sampling):

		<u>Units</u>
Sample Type:	EQUIP. R.	
Turbidity:	9.99	NTU
Free Phase Product:	NO	
Water Temperature:	11.52	Celsius
pH:	7.57	Standard Units
Dissolved Ox Concentrations:	7.75	mg/L
REDOX Potential:	219.8	-/+ mV
Conductivity:	503	umhos/cm
Filtered for Dissolved Metals:	YES	
Color:	MILKY WHITE	
Odor:	NONE	
Groundwater Level:	67.49	Feet MSL
Total Depth:	72.8	



Field Data

Project Data:

Contract Number:	USACE # 06-005
Project/Site Name:	OUE-AVMA
Date:	10/19/2005
Location (AP):	AP-4411
Sample ID:	0510FROAWA-08
Matrix:	WATER

Location Data:

Sample Location:		
UTM WGS84 Zone 6	<u>X Coord</u>	<u>Y Coord</u>
Meters:	149 42.806	61 15.449

Field Data (From Stabilized or Last Recording Prior to Sampling):

		<u>Units</u>
Sample Type:	PRIMARY	
Turbidity:	9.99	NTU
Free Phase Product:	NO	
Water Temperature:	11.52	Celsius
pH:	7.57	Standard Units
Dissolved Ox Concentrations:	7.75	mg/L
REDOX Potential:	219.8	-/+ mV
Conductivity:	503	umhos/cm
Filtered for Dissolved Metals:	YES	
Color:	MILKY WHITE	
Odor:	NONE	
Groundwater Level:	67.49	Feet MSL
Total Depth:	72.8	



Field Data

Project Data:

Contract Number:	USACE # 06-005
Project/Site Name:	OUE-AVMA
Date:	10/19/2005
Location (AP):	AP-4342
Sample ID:	0510FROAWA-12
Matrix:	WATER

Location Data:

Sample Location:		
UTM WGS84 Zone 6	<u>X Coord</u>	<u>Y Coord</u>
Meters:	149 42.995	61 15.455

Field Data (From Stabilized or Last Recording Prior to Sampling):

		<u>Units</u>
Sample Type:	PRIMARY	
Turbidity:	NA	NTU
Free Phase Product:	NO	
Water Temperature:	NA	Celsius
pH:	NA	Standard Units
Dissolved Ox Concentrations:	NA	mg/L
REDOX Potential:	NA	-/+ mV
Conductivity:	NA	umhos/cm
Filtered for Dissolved Metals:	YES	
Color:	BROWN	
Odor:	NONE	
Groundwater Level:	97.02	Feet MSL
Total Depth:	101.9	



Field Data

Project Data:

Contract Number:	USACE # 06-005
Project/Site Name:	OUE-AVMA
Date:	10/19/2005
Location (AP):	AP-4341
Sample ID:	0510FROAWA-11
Matrix:	WATER

Location Data:

Sample Location:		
UTM WGS84 Zone 6	<u>X Coord</u>	<u>Y Coord</u>
Meters:	149 42.883	61 15.379

Field Data (From Stabilized or Last Recording Prior to Sampling):

		<u>Units</u>
Sample Type:	PRIMARY	
Turbidity:	NA	NTU
Free Phase Product:	NO	
Water Temperature:	NA	Celsius
pH:	NA	Standard Units
Dissolved Ox Concentrations:	NA	mg/L
REDOX Potential:	NA	-/+ mV
Conductivity:	NA	umhos/cm
Filtered for Dissolved Metals:	YES	
Color:	BROWN	
Odor:	NONE	
Groundwater Level:	63.97	Feet MSL
Total Depth:	68.1	



Field Data

Project Data:

Contract Number:	USACE # 06-005
Project/Site Name:	OUE-AVMA
Date:	10/18/2005
Location (AP):	AP-3893
Sample ID:	0510FROAWA-03
Matrix:	WATER

Location Data:

Sample Location:		
UTM WGS84 Zone 6	<u>X Coord</u>	<u>Y Coord</u>
Meters:	149 42.294	61 15.511

Field Data (From Stabilized or Last Recording Prior to Sampling):

		<u>Units</u>
Sample Type:	PRIMARY	
Turbidity:	0.35	NTU
Free Phase Product:	NO	
Water Temperature:	7.22	Celsius
pH:	9	Standard Units
Dissolved Ox Concentrations:	2.4	mg/L
REDOX Potential:	-13.5	-/+ mV
Conductivity:	200	umhos/cm
Filtered for Dissolved Metals:	YES	
Color:	CLEAR	
Odor:	NONE	
Groundwater Level:	87.36	Feet MSL
Total Depth:	125.6	



Field Data

Project Data:

Contract Number:	USACE # 06-005
Project/Site Name:	OUE-AVMA
Date:	10/18/2005
Location (AP):	AP-3871
Sample ID:	0510FROAWA-01
Matrix:	WATER

Location Data:

Sample Location:		
UTM WGS84 Zone 6	<u>X Coord</u>	<u>Y Coord</u>
Meters:	149 43.146	61 15.591

Field Data (From Stabilized or Last Recording Prior to Sampling):

		<u>Units</u>
Sample Type:	PRIMARY	
Turbidity:	0.58	NTU
Free Phase Product:	NO	
Water Temperature:	6.07	Celsius
pH:	8.06	Standard Units
Dissolved Ox Concentrations:	7.05	mg/L
REDOX Potential:	145.1	-/+ mV
Conductivity:	418	umhos/cm
Filtered for Dissolved Metals:	YES	
Color:	CLEAR	
Odor:	NONE	
Groundwater Level:	106.34	Feet MSL
Total Depth:	121.1	



Field Data

Project Data:

Contract Number:	USACE # 06-005
Project/Site Name:	OUE-AVMA
Date:	10/19/2005
Location (AP):	AP-3870
Sample ID:	0510FROAWA-06
Matrix:	WATER

Location Data:

Sample Location:		
UTM WGS84 Zone 6	<u>X Coord</u>	<u>Y Coord</u>
Meters:	149 43.580	61 15.525

Field Data (From Stabilized or Last Recording Prior to Sampling):

		<u>Units</u>
Sample Type:	PRIMARY/MSMSD	
Turbidity:	5.98	NTU
Free Phase Product:	NO	
Water Temperature:	8.63	Celsius
pH:	7.57	Standard Units
Dissolved Ox Concentrations:	7.42	mg/L
REDOX Potential:	179.2	-/+ mV
Conductivity:	463	umhos/cm
Filtered for Dissolved Metals:	YES	
Color:	CLEAR	
Odor:	NONE	
Groundwater Level:	95.29	Feet MSL
Total Depth:	110.7	



Field Data

Project Data:

Contract Number:	USACE # 06-005
Project/Site Name:	OUE-AVMA
Date:	10/19/2005
Location (AP):	AP-3870
Sample ID:	0510FROAWA-07
Matrix:	WATER

Location Data:

Sample Location:		
UTM WGS84 Zone 6	<u>X Coord</u>	<u>Y Coord</u>
Meters:	149 43.580	61 15.525

Field Data (From Stabilized or Last Recording Prior to Sampling):

		<u>Units</u>
Sample Type:	DUPLICATE	
Turbidity:	5.98	NTU
Free Phase Product:	NO	
Water Temperature:	8.63	Celsius
pH:	7.57	Standard Units
Dissolved Ox Concentrations:	7.42	mg/L
REDOX Potential:	179.2	-/+ mV
Conductivity:	463	umhos/cm
Filtered for Dissolved Metals:	YES	
Color:	CLEAR	
Odor:	NONE	
Groundwater Level:	95.29	Feet MSL
Total Depth:	110.7	



Field Data

Project Data:

Contract Number:	USACE # 06-005
Project/Site Name:	OUE-AVMA
Date:	10/18/2005
Location (AP):	AP-3774
Sample ID:	0510FROAWA-02
Matrix:	WATER

Location Data:

Sample Location:		
UTM WGS84 Zone 6	<u>X Coord</u>	<u>Y Coord</u>
Meters:	149 43.348	61 15.519

Field Data (From Stabilized or Last Recording Prior to Sampling):

		<u>Units</u>
Sample Type:	PRIMARY	
Turbidity:	0.63	NTU
Free Phase Product:	NO	
Water Temperature:	6.17	Celsius
pH:	8.31	Standard Units
Dissolved Ox Concentrations:	6.32	mg/L
REDOX Potential:	117.4	-/+ mV
Conductivity:	423	umhos/cm
Filtered for Dissolved Metals:	YES	
Color:	CLEAR	
Odor:	NONE	
Groundwater Level:	102.52	Feet MSL
Total Depth:	117.6	



Field Data

Project Data:

Contract Number:	USACE # 06-005
Project/Site Name:	OUE-AVMA
Date:	10/18/2005
Location (AP):	AP-3534
Sample ID:	0510FROAWA-05
Matrix:	WATER

Location Data:

Sample Location:		
UTM WGS84 Zone 6	<u>X Coord</u>	<u>Y Coord</u>
Meters:	149 43.004	61 15.503

Field Data (From Stabilized or Last Recording Prior to Sampling):

		<u>Units</u>
Sample Type:	PRIMARY	
Turbidity:	0.2	NTU
Free Phase Product:	NO	
Water Temperature:	6.15	Celsius
pH:	8.22	Standard Units
Dissolved Ox Concentrations:	3.55	mg/L
REDOX Potential:	142.9	-/+ mV
Conductivity:	266	umhos/cm
Filtered for Dissolved Metals:	YES	
Color:	CLEAR	
Odor:	NONE	
Groundwater Level:	105.6	Feet MSL
Total Depth;	140.4	



Field Data

Project Data:

Contract Number:	USACE # 06-005
Project/Site Name:	OUE-AVMA
Date:	10/19/2005
Location (AP):	AP-4413
Sample ID:	0510FROAWA-10
Matrix:	WATER

Location Data:

Sample Location:		
UTM WGS84 Zone 6	<u>X Coord</u>	<u>Y Coord</u>
Meters:	149 42.952	61 15.385

Field Data (From Stabilized or Last Recording Prior to Sampling):

		<u>Units</u>
Sample Type:	PRIMARY	
Turbidity:	NA	NTU
Free Phase Product:	NO	
Water Temperature:	NA	Celsius
pH:	NA	Standard Units
Dissolved Ox Concentrations:	NA	mg/L
REDOX Potential:	NA	-/+ mV
Conductivity:	NA	umhos/cm
Filtered for Dissolved Metals:	YES	
Color:	BROWN	
Odor:	NONE	
Groundwater Level:	72.13	Feet MSL
Total Depth:	75.4	



**FINAL REPORT
FORT RICHARDSON
OUE-AVMA**

**APPENDIX C: SAMPLE INVENTORY
RECORDS**

FORT RICHARDSON, ALASKA

PREPARED FOR:



**U.S. Army, Directorate of Public Works
Contract No. W911KB-04-P-0091**

June 2006



**US Army
Installation Management Agency**



**US Army Corps
of Engineers®
Alaska District**



Satori Group, Inc.
1510 E. 66th Ave., #2
Anchorage, AK 99518



SATORIGROUP INC.

SAMPLE TRACKING LOG

Fort Richardson Groundwater Monitoring Program

Former Building OUE, October 2005 Sampling Event

Sample ID	Actual Well Number	Chain of Custody Well Number	Date	Actual Time Collected	Chain of Custody Time	Matrix	Type
0510FROAWA-01	AP-3871	AP-3871	10/18/05	1035	1035	WATER	PRIMARY
0510FROAWA-02	AP-3774	AP-3774	10/18/05	1230	1230	WATER	PRIMARY
0510FROAWA-03	AP-3893	AP-3893	10/18/05	1530	1530	WATER	PRIMARY
0510FROAWA-04	AP-3468	AP-3468	10/18/05	1700	1700	WATER	PRIMARY
0510FROAWA-05	AP-3534	AP-3534	10/18/05	1815	1815	WATER	PRIMARY
0510FROAWA-06	AP-3870	AP-3870	10/19/05	1155	1155	WATER	PRIMARY_MS/MSD
0510FROAWA-07	AP-3870	AP-3888	10/19/05	1155	1125	WATER	DUPLICATE
0510FROAWA-08	AP-4411	AP-4411	10/19/05	1440	1440	WATER	PRIMARY
0510FROAWA-09	AP-4411	AP-4411	10/19/05	1705	1705	WATER	EQUIPMENT RINSE
0510FROAWA-10	AP-4413	AP-4413	10/19/05	1735	1735	WATER	PRIMARY
0510FROAWA-11	AP-4341	AP-4341	10/19/05	1750	1750	WATER	PRIMARY
0510FROAWA-12	AP-4342	AP-4342	10/19/05	1815	1815	WATER	PRIMARY

Case Narrative

Customer: ENHSINC

Satori Group, Inc.

Project: 1057045

Ft Richardson Groundwater

NPDL WO: 06-005

Refer to the sample receipt form for information on sample condition.

1057045007 BMS

8260 - BMS/BMSD recovery for 2-chloroethyl vinyl ether do not meet QC goals due to sample pH. The acid preservative hydrolyzes this analyte, precluding the ability to measure it in the QC or field samples.

666676 MS

8270 - MS recovery for 2-methylphenol is biased low and does not meet QC recovery goals. See LCS for recovery.

666882 MS

353.2 - The MS failed to meet QC criteria. The batch LCS is within QC limits.

666677 MSD

8270 - MSD recoveries for several analytes are biased low and do not meet QC recovery goals. See LCS for recoveries.

668811 CCV

8260 - CCV recovery for bromomethane is biased low and does not meet laboratory QC goals. This analyte is not reported in association with this CCV.

668623 IB

8260 - IB result for toluene is greater than the PQL. This analyte is not reported in association with this IB.

CHAIN OF CUSTODY RECORD

CT&E Environmental Services Inc.
Laboratory Division

1 CLIENT: **SATORI Group** PHONE NO: **957 1332 0456**

CONTACT: **D. Lucas** PROJECT: **FT. RICHARDSON GROUNDWATER** PWSID#: _____

REPORTS TO: **D. Lucas** FAX NO: **(907) 332-0457** QUOTE# **7268A**

INVOICE TO: **J. Lucas** P.O. NUMBER: **05-025**

CT&E Reference

No.	SAMPLE TYPE C = COMP G = GRAB	Preservatives Used										REMARKS	
		EPA 300 (Chloride Nitrate/nitrite sulfate)	EPA 300 (Cu, sulfate nitrate/nitrite)	6030 (Fe, Mn)	EPA 300 (Sulfate)	As88	HNO3	As88	EPA 300 (Sulfate)	As88	HNO3		As88
3	G	X	X	X	X	X	X	X	X	X	X	X	AP-3744
3	G	X	X	X	X	X	X	X	X	X	X	X	AP-3981
3	G	X	X	X	X	X	X	X	X	X	X	X	AP-3985
3	G	X	X	X	X	X	X	X	X	X	X	X	AP-3984
3	G	X	X	X	X	X	X	X	X	X	X	X	AP-3871
3	G	X	X	X	X	X	X	X	X	X	X	X	AP-3774
3	G	X	X	X	X	X	X	X	X	X	X	X	AP-3893
3	G	X	X	X	X	X	X	X	X	X	X	X	AP-3468
3	G	X	X	X	X	X	X	X	X	X	X	X	AP-3534
9	G	X	X	X	X	X	X	X	X	X	X	X	AP-3870 TMY MSD

Shipping Carrier: _____

Shipping Ticket No: **David**

Data Deliverables: Level I Level II Level III EDD Type: **COECT**

Temperature C: **TB29C 4.1**

Chain of Custody Seal: (Circle) **INTACT** BROKEN ABSENT

Requested Turnaround Time and Special Instructions:
 email cedar@paa.usace.army.mil
 0510 FROBWA-31 TO-34 = USACE PROJ 06-003
 0510 FROBWA-01 TO-06 = USACE PROJ 06-005
 * METALS FIELD FILTERED MATRIX CODE = WA COOLER HAND DELIVERED

2

LAB NO.	SAMPLE IDENTIFICATION	DATE	TIME	MATRIX	Collected/Relinquished By: (1)	Date	Time	Received By:
0510FROBWA-31	10/17/05	1140	H2O	Drew Jurn	10/08	1005		
0510FROBWA-32	10/17/05	1255	H2O					
0510FROBWA-33	10/17/05	1435	H2O					
0510FROBWA-34	10/17/05	1400	H2O					
0510FROAWA-01	10/18/05	1035	H2O					
0510FROAWA-02	10/18/05	1230	H2O					
0510FROAWA-03	10/18/05	1530	H2O					
0510FROAWA-04	10/18/05	1700	H2O					
0510FROAWA-05	10/18/05	1815	H2O					
0510FROAWA-06	10/19/05	1155	H2O					

4

Relinquished By: (2)	Date	Time	Received By:
Drew Jurn	10/08	1005	

5

Relinquished By: (3)	Date	Time	Received For Laboratory By:

6

Relinquished By: (4)	Date	Time	Received For Laboratory By:
	11/3	10/20/05	Benedict



CHAIN OF CUSTODY RECORD

CT&E Environmental Services Inc.
Laboratory Division

1 CLIENT: **SATORI GROUP** PHONE NO: (907) 332 0456
 CONTACT: **D. Lucas**
 PROJECT: **FT. RICHARDSON GROUNDWATER** PWSID#: **GROUNDWATER**
 REPORTS TO:
D. Lucas FAX NO: (907) 332 0457
 INVOICE TO:
D. Lucas QUOTE# **7268A**
 P.O. NUMBER: **05-025**

CT&E Reference

PAGE 1 OF 2

No.	CONTAINERS	SAMPLE TYPE	C = COMP G = GRAB	Preservatives Used	Analysis Required	REMARKS
5	6	G		X	X	AP-3534
6	18	G		X	X	AP-3870 + M ^s /MSD
7	6	G		X	X	AP-3888
8	6	G		X	X	AP-4411
9	6	G		X	X	E. RINSE
10	6	G		X	X	AP-4413
11	6	G		X	X	AP-4341
12	6	G		X	X	AP-4342

8260 VOC
 SK175
 (METHANE)
 A-F
 A-F
 A-F
 A-F
 A-F
 A-F
 A-F

2

LAB NO	SAMPLE IDENTIFICATION	DATE	TIME	MATRIX	Received By:
5	0510FROAWA-05	10/18/05	1815	H ₂ O	
6	0510FROAWA-06	10/19/05	1155	H ₂ O	
7	0510FROAWA-07	10/19/05	11:25	H ₂ O	
8	0510FROAWA-08	10/19/05	1440	H ₂ O	
9	0510FROAWA-09	10/19/05	1705	H ₂ O	
10	0510FROAWA-10	10/19/05	1735	H ₂ O	
11	0510FROAWA-11	10/19/05	1750	H ₂ O	
12	0510FROAWA-12	10/19/05	1815	H ₂ O	

5 Collected/Relinquished By: (1) *[Signature]* Received By: *[Signature]*
 Relinquished By: (2) *[Signature]* Received By: *[Signature]*
 Relinquished By: (3) *[Signature]* Received By: *[Signature]*
 Relinquished By: (4) *[Signature]* Received For Laboratory By: *[Signature]*

4

Shipping Carrier: *hand*

Shipping Ticket No: *hand*

Data Deliverables: Level I Level II Level III EDD Type: COELT

Temperature C: *C=21TB6.0*

Chain of Custody Seal: (Circle) INTACT BROKEN ABSENT

Requested Turnaround Time and Special Instructions:
 email cooler@paa.usace.army.mil
 USACE project NO. 06-005
 * MATRIX code WA
 * cooler hand delivered

1057045

CHAIN OF CUSTODY RECORD

CT&E Environmental Services Inc.
Laboratory Division

CLIENT: SATOBI GROUP

CONTACT: D. Lucas PHONE NO: (907) 332 0456

PROJECT: FT. RICHARDSON GROUNDWATER PWSID#:

REPORTS TO:

D. Lucas QUOTE# 7208A

INVOICE TO: J. Lucas FAX NO: (907)

P.O. NUMBER: 05-025

CT&E Reference:

No.	CONTAINERS	SAMPLE TYPE C = COMP G = GRAB	Preservatives Used Analysis Required	Matrix			REMARKS
				H2O	H2O	H2O	
6	8660 VOC	G	X	X	X	AP-3744	
6	RISK 175 (METHANE) ETHANE, ETHYLENE	G	X	X	X	AP-3981	
6	RISK 175 (METHANE) ETHANE, ETHYLENE	G	X	X	X	AP-3985	
6	RISK 175 (METHANE) ETHANE, ETHYLENE	G	X	X	X	AP-3984	
3	8270-SIM	G	X	X	X	TRIP BLANK	
3	8270-SIM	G	X	X	X	TRIP BLANK	
6	RISK 175 (METHANE) ETHANE, ETHYLENE	G	X	X	X	AP-3871	
6	RISK 175 (METHANE) ETHANE, ETHYLENE	G	X	X	X	AP-3774	
8	RISK 175 (METHANE) ETHANE, ETHYLENE	G	X	X	X	AP-3893	
6	RISK 175 (METHANE) ETHANE, ETHYLENE	G	X	X	X	AP-3468	

Shipping Carrier: Hand

Shipping Ticket No.:

Data Deliverables:
Level I Level II EDD Type: COELT

Requested Turnaround Time and Special Instructions:
email cooler @ poa, usace. army. mil
0510FROBWA-31 TO-34 = USACE PROJ 06-002
0510FROBWA-01 TO-04 = USACE PROJ 06-005
*cooler hand delivered MATRIX code WA

Temperature C: C=21 TB6.0

Chain of Custody Seal: (Circle)
INTACT - BROKEN - ABSENT

LAB NO	SAMPLE IDENTIFICATION	DATE	TIME	MATRIX	Received By:
0510FROBWA-31	10/17/05	11:40	H2O	10/20/05	
0510FROBWA-32	10/17/05	12:55	H2O	10/20/05	
0510FROBWA-33	10/17/05	14:35	H2O	10/20/05	
0510FROBWA-34	10/17/05	16:00	H2O	10/20/05	
0510FROBWA-35	10/17/05	08:00	H2O	10/20/05	
0510FROBWA-36	10/17/05	08:00	H2O	10/20/05	
0510FROAWA-01	10/18/05	10:35	H2O	10/20/05	
0510FROAWA-02	10/18/05	12:30	H2O	10/20/05	
0510FROAWA-03	10/18/05	15:30	H2O	10/20/05	
0510FROAWA-04	10/18/05	17:00	H2O	10/20/05	

Collected/Relinquished By: (1) John Jim Received By: [Signature]

Relinquished By: (2) [Signature] Received By: [Signature]

Relinquished By: (3) [Signature] Received By: [Signature]

Relinquished By: (4) [Signature] Received For Laboratory By: Berndy Sheets



CHAIN OF CUSTODY RECORD
SGS Environmental Services Inc.

1 CLIENT: SATORI GROUP
 CONTACT: D. Lucas PHONE NO: (907) 332 0456
 PROJECT: F. RICHARDSON GROUNDWATER SITES/WSID#:
 REPORTS TO:
D. Lucas FAX NO.: (907) 332 0457
 INVOICE TO: QUOTE # 7268 A
J. Lucas P.O. NUMBER 05-025

SGS Reference: PAGE 2 OF 2

NO CONTAINERS	SAMPLE TYPE	PRESERVATIVES USED	ANALYSIS REQUIRED	REMARKS					
				C=COMP	G=GRAB				
3	G	X	X	X	X	X	X	AP-3888	
3	G	X	X	X	X	X	X	AP-4411	
3	G	X	X	X	X	X	X	AP-E-RINSE	
3	G	X	X	X	X	X	X	AP-4413	
3	G	X	X	X	X	X	X	AP-4341	
3	G	X	X	X	X	X	X	AP-4342	

2

Preservatives Used: EPA 300 (Sulfate), Nitrate/Nitrite, EPA 300 (Sulfate), Nitrate/Nitrite, 6030 (Al, As, Fe, Mn), HNO₃, HClO₄, HNO₃

Shipping Carrier: Hand

Shipping Ticket No: 7B29.C41

Special Deliverable Requirements: LEVEL III COELT

Chain of Custody Seal: (Circle) INTACT BROKEN ABSENT

Samples Received Cold? (Circle) YES NO

Temperature C: 13.29 C 41

Requested Turnaround Time and Special Instructions:
 email coden @ poa.usace.army.mil
 USACE Project No. 06-005
 * Metals field filtered
 * Matrix code w/ a cooler hand delivered

5

Collected/Relinquished By: (1)	Date	Time	Received By:	Time
<u>Derek Jones</u>	<u>10/20/05</u>	<u>1005</u>		
Relinquished By: (2)	Date	Time	Received By:	Time
			<u>Derek Jones</u>	<u>10/20/05</u>
Relinquished By: (3)	Date	Time	Received By:	Time
			<u>Derek Jones</u>	<u>10/20/05</u>
Relinquished By: (4)	Date	Time	Received By:	Time
	<u>10/20/05</u>	<u>7153</u>	<u>Derek Jones</u>	

SAMPLE RECEIPT FORM

SGS WO#:

105-7045

Yes No NA

- Are samples RUSH, priority, or w/n 72 hrs. of hold time?
- If yes have you done e-mail notification?
- Are samples within 24 hrs. of hold time or due date?
- If yes, have you spoken with Supervisor?
- Archiving bottles- if req., are they properly marked?
- Are there any problems? PM Notified? _____
- Were samples preserved correctly and pH verified?

Due Date: 11/4/05
 Received Date: 10/20/05
 Received Time: 1153
 Is date/time conversion necessary? NO
 # of hours to AK Local Time: _____
 Thermometer ID: 690

Cooler ID	Temp Blank	Cooler Temp
1	6.0 °C	2.1 °C
2	2.9 °C	4.1 °C
	°C	°C
	°C	°C
	°C	°C

*Temperature readings include thermometer correction factors

Delivery method (circle all that apply): Client /
 Alert Courier / UPS / FedEx / USPS /
 AA Goldstreak / NAC / ERA / PenAir / Carille
 Lynden / SGS / Other: _____

Airbill # _____

Additional Sample Remarks: (if applicable)

- Extra Sample Volume?
- Limited Sample Volume?
- Field preserved for volatiles?
- Field-filtered for dissolved?
- Lab-filtered for dissolved?
- Ref Lab required? _____
- Foreign Soil?

This section must be filled out for DoD projects (USACE, Navy, AFCEE)

Yes No
 Is received temperature 4 ± 2°C?
 Exceptions: _____ Samples/Analyses Affected: _____

Rad Screen performed? Result: _____
 Was there an airbill? (Note # above in the right hand column) NO

Was cooler sealed with custody seals?
 # / where: _____

Were seal(s) intact upon arrival?

Was there a COC with cooler?

Was COC sealed in plastic bag & taped inside lid of cooler?

Was the COC filled out properly?

Did the COC indicate COE / AFCEE / Navy project?

Did the COC and samples correspond?

Were all sample packed to prevent breakage?
 Packing material: Bubblewrap/Verum

Were all samples unbroken and clearly labeled? 10/25/05

Were all samples sealed in separate plastic bags?

Were all VOCs free of headspace and/or MeOH preserved?

Were correct container / sample sizes submitted?

Is sample condition good?

Was copy of CoC, SRF, and custody seals given to PM to fax?

This section must be filled if problems are found

Yes No
 Was client notified of problems?

Individual contacted: D Lucas

Voice Phone / Fax / Email (circle one)

Date/Time: 10/24/05

Reason for contact: 8270?

8270-8270CJM

Change Order Required? No

SGS Contact: _____

Notes:

Completed by (sign): Brenda Sheets (print): Brenda Sheets

Login proof (check one): waived _____ required _____ performed by: _____

FINAL REPORT
FORT RICHARDSON
OUE-AVMA

APPENDIX D: LABORATORY ANALYTICAL
RESULTS

FORT RICHARDSON, ALASKA

PREPARED FOR:



U.S. Army, Directorate of Public Works
Contract No. W911KB-04-P-0091

June 2006



US Army
Installation Management Agency



US Army Corps
of Engineers®
Alaska District



Satori Group, Inc.
1510 E. 66th Ave., #2
Anchorage, AK 99518

SGS Environmental Services Inc.
Alaska Division
Laboratory Data Report

Project: Ft Richardson Groundwater
Client: Satori Group, Inc.
SGS Work Order: 1057045
NPDL Work Order: 06-005

Except as noted on the case narrative, all quality assurance/quality control criteria is in compliance with the standards set forth by the Alaska Department of Environmental Conservation (ADEC), the SGS Quality Assurance Program Plan, and the National Environmental Laboratory Accreditation Conference.

Please contact your Project Manager and/or the Quality Assurance Manager should any questions occur.

Prepared by	(Signature)	<u>[Signature]</u>
	(Printed Name)	<u>Ilan Bsz</u>
	(Date)	<u>12/3/05</u>
Released by	(Signature)	<u>[Signature]</u>
	(Printed Name)	<u>WAZVIMINPA C. HORVATG</u>
	(Title)	<u>Data Package Reviewer</u>
	(Date)	<u>12/09/05</u>

This report contains a total number of 677 pages.



Laboratory Analytical Report

Client: **Satori Group, Inc.**
1310 E. 66th Ave #2
Anchorage, AK 99518

Attn: **Derek Lucas**
T: (907)332-0456 F:(907)332-0457
dlucas@gosatori.com

Project: **Ft Richardson Groundwater**
Workorder No.: **1057045**

Certification:

I certify that this data package is in compliance with the terms and conditions of the contract, both technically and for completeness, other than the conditions noted on the sample data sheet(s) and/or the case narrative. This certification applies only to the tested parameters and the specific sample(s) received at the laboratory.

Released by:

SGS

Victoria Bayly

2005.11.16

16:09:34 -09'00'

Alaska Division Project Manager

Victoria Bayly
Victoria_Bayly@sgs.com
Project Manager

Report Date

Total number of pages in report : _____

Enclosed are the analytical results associated with this workorder.

As required by the state of Alaska and the USEPA, a formal Quality Assurance/Quality Control Program is maintained by SGS. A copy of our Quality Control Manual that outlines this program is available at your request. The laboratory ADEC certification numbers are AK08-03 (DW), UST-005 (CS) and AK00971 (Micro).

The laboratory NELAC certification number is 001327.

Except as specifically noted, all statements and data in this report are in conformance to the provisions set forth by the SGS Quality Assurance Program Plan and the National Environmental Laboratory Accreditation Program.

The following descriptors may be found on your report which will serve to further qualify the data.

MDL	Method Detection Limit
PQL	Practical Quantitation Limit (reporting limit).
CL	Control Limit
U	Indicates the analyte was analyzed for but not detected.
F	Indicates value that is greater than or equal to the MDL.
J	The quantitation is an estimation.
ND	Indicates the analyte is not detected
B	Indicates the analyte is found in a blank associated with the sample.
*	The analyte has exceeded allowable regulatory or control limits.
GT	Greater Than
LT	Less Than
Q	QC parameter out of acceptance range.
M	A matrix effect was present.
E	The analyte result is above the calibrated range.
DF	Analytical Dilution Factor
JL	The analyte was positively identified, but the quantitation is a low estimation.
<Surr>	Surrogate QC spiked standard

Note: Soil samples are reported on a dry weight basis unless otherwise specified



SAMPLE SUMMARY

Print Date: 11/15/2005

Client Name: Satori Group, Inc.
Project Name: Ft Richardson Groundwater
Workorder No.: 1057045

Analytical Methods

<u>Method Description</u>	<u>Analytical Method</u>
8270 PAH SIM Semi-Volatiles GC/MS	8270C SIMS
Dissolved Metals by ICP-MS	SW6020 Diss.
Ion Chromatographic Analysis (W)	EPA 300.0
Light Gases in Water	RSK-175
Nitrate/Nitrite Flow injection Pres.	EPA 353.2
Volatile Organic Compounds (W) FULL	SW8260B

Sample ID Cross Reference

<u>Lab Sample ID</u>	<u>Client Sample ID</u>
1057045001	0510FROAWA-01
1057045002	0510FROAWA-02
1057045003	0510FROAWA-03
1057045004	0510FROAWA-04
1057045005	0510FROAWA-05
1057045006	0510FROAWA-06
1057045010	0510FROAWA-07
1057045011	0510FROAWA-08
1057045012	0510FROAWA-09
1057045013	0510FROAWA-10
1057045014	0510FROAWA-11
1057045015	0510FROAWA-12



Satori Group, Inc.

Print Date: 11/15/2005

Client Sample ID: 0510FROAWA-01
SGS Ref. #: 1057045001
Project ID: Ft Richardson Groundwater
Matrix: Water (Surface, Eff., Ground)

All Dates/Times are Alaska Local Time
Collection Date/Time: 10/18/05 10:35
Receipt Date/Time: 10/20/05 11:53
Location: AP-3871

Dissolved Metals

<u>Parameter</u>	<u>Result</u>	<u>PQL/CL</u>	<u>MDL</u>	<u>Units</u>	<u>DF</u>	<u>Analytical Batch</u>	<u>Prep Batch</u>	<u>Qualifiers</u>
Aluminum	ND	100	31.0	ug/L	5	MMS3861	MXX16522	
Arsenic	ND	10.0	3.10	ug/L	5	MMS3861	MXX16522	
Iron	ND	1000	310	ug/L	5	MMS3861	MXX16522	
Manganese	ND	2.00	0.620	ug/L	5	MMS3861	MXX16522	

Batch Information

Analytical Batch: MMS3861
Analytical Method: SW6020 Diss.
Analysis Date/Time: 10/28/05 12:31
Dilution Factor: 5

Prep Batch: MXX16522
Prep Method: FILTER
Prep Date/Time: 10/18/05 10:35

Initial Prep Wt./Vol.: 100 mL
Prep Extract Vol.: 100 mL
Container ID:1057045001-I
Analyst: TK



Satori Group, Inc.

Print Date: 11/15/2005

Client Sample ID: 0510FROAWA-01
SGS Ref. #: 1057045001
Project ID: Ft Richardson Groundwater
Matrix: Water (Surface, Eff., Ground)

All Dates/Times are Alaska Local Time
Collection Date/Time: 10/18/05 10:35
Receipt Date/Time: 10/20/05 11:53
Location: AP-3871

Waters Department

<u>Parameter</u>	<u>Result</u>	<u>PQL/CL</u>	<u>MDL</u>	<u>Units</u>	<u>DF</u>	<u>Analytical Batch</u>	<u>Prep Batch</u>	<u>Qualifiers</u>
Sulfate	22.2	0.100	0.0310	mg/L	1	WIC3768		
Total Nitrate/Nitrite-N	1.93	0.100	0.0310	mg/L	5	WFI1073		

Batch Information

Analytical Batch: WFI1073	Initial Prep Wt./Vol.: 100 mL
Analytical Method: EPA 353.2	
Analysis Date/Time: 10/20/05 16:52	Container ID:1057045001-G
Dilution Factor: 5	Analyst: AZS
Analytical Batch: WIC3768	Initial Prep Wt./Vol.: 5 mL
Analytical Method: EPA 300.0	
Analysis Date/Time: 10/21/05 11:16	Container ID:1057045001-H
Dilution Factor: 1	Analyst: JEM



Satori Group, Inc.

Print Date: 11/15/2005

Client Sample ID: 0510FROAWA-01
SGS Ref. #: 1057045001
Project ID: Ft Richardson Groundwater
Matrix: Water (Surface, Eff., Ground)

All Dates/Times are Alaska Local Time
Collection Date/Time: 10/18/05 10:35
Receipt Date/Time: 10/20/05 11:53
Location: AP-3871

Light Gases

<u>Parameter</u>	<u>Result</u>	<u>PQL/CL</u>	<u>MDL</u>	<u>Units</u>	<u>DF</u>	<u>Analytical Batch</u>	<u>Prep Batch</u>	<u>Qualifiers</u>
Methane	ND	5.00	1.50	ug/L	1	GAS1262		

Batch Information

Analytical Batch: GAS1262
Analytical Method: RSK-175
Analysis Date/Time: 10/27/05 12:16
Dilution Factor: 1

Initial Prep Wt./Vol.: 1 mL
Container ID: 1057045001-D
Analyst: KWM



Satori Group, Inc.

Print Date: 11/15/2005

Client Sample ID: **0510FROAWA-01**
 SGS Ref. #: 1057045001
 Project ID: Ft Richardson Groundwater
 Matrix: Water (Surface, Eff., Ground)

All Dates/Times are Alaska Local Time
 Collection Date/Time: 10/18/05 10:35
 Receipt Date/Time: 10/20/05 11:53
 Location: AP-3871

Volatile Gas Chromatography/Mass Spectroscopy

<u>Parameter</u>	<u>Result</u>	<u>PQL/CL</u>	<u>MDL</u>	<u>Units</u>	<u>DF</u>	<u>Analytical Batch</u>	<u>Prep Batch</u>	<u>Qualifiers</u>
Dichlorodifluoromethane	ND	1.00	0.310	ug/L	1	VMS7993	VXX14625	
Chloromethane	ND	1.00	0.310	ug/L	1	VMS7993	VXX14625	
Vinyl chloride	ND	1.00	0.310	ug/L	1	VMS7993	VXX14625	
Bromomethane	ND	3.00	0.940	ug/L	1	VMS7993	VXX14625	
Chloroethane	ND	1.00	0.310	ug/L	1	VMS7993	VXX14625	
Trichlorofluoromethane	ND	1.00	0.310	ug/L	1	VMS7993	VXX14625	
1,1-Dichloroethene	ND	1.00	0.310	ug/L	1	VMS7993	VXX14625	
Methylene chloride	ND	5.00	1.00	ug/L	1	VMS7993	VXX14625	
Carbon disulfide	ND	2.00	0.620	ug/L	1	VMS7993	VXX14625	
Acetone	ND	10.0	3.10	ug/L	1	VMS7993	VXX14625	
trans-1,2-Dichloroethene	ND	1.00	0.310	ug/L	1	VMS7993	VXX14625	
1,1-Dichloroethane	ND	1.00	0.310	ug/L	1	VMS7993	VXX14625	
2,2-Dichloropropane	ND	1.00	0.310	ug/L	1	VMS7993	VXX14625	
cis-1,2-Dichloroethene	ND	1.00	0.310	ug/L	1	VMS7993	VXX14625	
2-Butanone (MEK)	ND	10.0	3.10	ug/L	1	VMS7993	VXX14625	
Bromochloromethane	ND	1.00	0.310	ug/L	1	VMS7993	VXX14625	
Chloroform	2.92	1.00	0.300	ug/L	1	VMS7993	VXX14625	
1,1,1-Trichloroethane	ND	1.00	0.310	ug/L	1	VMS7993	VXX14625	
Carbon tetrachloride	0.840 J	1.00	0.310	ug/L	1	VMS7993	VXX14625	
1,1-Dichloropropene	ND	1.00	0.310	ug/L	1	VMS7993	VXX14625	
Benzene	ND	0.400	0.120	ug/L	1	VMS7993	VXX14625	
Trichloroethene	ND	1.00	0.310	ug/L	1	VMS7993	VXX14625	
1,2-Dichloropropane	ND	1.00	0.310	ug/L	1	VMS7993	VXX14625	
Dibromomethane	ND	1.00	0.310	ug/L	1	VMS7993	VXX14625	
Bromodichloromethane	ND	0.500	0.150	ug/L	1	VMS7993	VXX14625	
2-Chloroethyl Vinyl Ether	ND	10.0	3.10	ug/L	1	VMS7993	VXX14625	
cis-1,3-Dichloropropene	ND	0.500	0.150	ug/L	1	VMS7993	VXX14625	
Toluene	ND	1.00	0.310	ug/L	1	VMS7993	VXX14625	
trans-1,3-Dichloropropene	ND	1.00	0.310	ug/L	1	VMS7993	VXX14625	
1,1,2-Trichloroethane	ND	1.00	0.310	ug/L	1	VMS7993	VXX14625	
Tetrachloroethene	ND	1.00	0.310	ug/L	1	VMS7993	VXX14625	
1,3-Dichloropropane	ND	0.400	0.120	ug/L	1	VMS7993	VXX14625	
Dibromochloromethane	ND	0.500	0.150	ug/L	1	VMS7993	VXX14625	
1,2-Dibromoethane	ND	1.00	0.310	ug/L	1	VMS7993	VXX14625	
Chlorobenzene	ND	0.500	0.150	ug/L	1	VMS7993	VXX14625	
1,1,1,2-Tetrachloroethane	ND	0.500	0.150	ug/L	1	VMS7993	VXX14625	
Ethylbenzene	ND	1.00	0.310	ug/L	1	VMS7993	VXX14625	



Satori Group, Inc.

Print Date: 11/15/2005

Client Sample ID: 0510FROAWA-01
 SGS Ref. #: 1057045001
 Project ID: Ft Richardson Groundwater
 Matrix: Water (Surface, Eff., Ground)

All Dates/Times are Alaska Local Time
 Collection Date/Time: 10/18/05 10:35
 Receipt Date/Time: 10/20/05 11:53
 Location: AP-3871

Volatile Gas Chromatography/Mass Spectroscopy

<u>Parameter</u>	<u>Result</u>	<u>PQL/CL</u>	<u>MDL</u>	<u>Units</u>	<u>DF</u>	<u>Analytical</u> <u>Batch</u>	<u>Prep</u> <u>Batch</u>	<u>Qualifiers</u>
P & M -Xylene	ND	2.00	0.620	ug/L	1	VMS7993	VXX14625	
Styrene	ND	1.00	0.310	ug/L	1	VMS7993	VXX14625	
Bromoform	ND	1.00	0.310	ug/L	1	VMS7993	VXX14625	
Isopropylbenzene (Cumene)	ND	1.00	0.310	ug/L	1	VMS7993	VXX14625	
Bromobenzene	ND	1.00	0.310	ug/L	1	VMS7993	VXX14625	
o-Xylene	ND	1.00	0.310	ug/L	1	VMS7993	VXX14625	
1,2,3-Trichloropropane	ND	1.00	0.310	ug/L	1	VMS7993	VXX14625	
n-Propylbenzene	ND	1.00	0.310	ug/L	1	VMS7993	VXX14625	
2-Chlorotoluene	ND	1.00	0.310	ug/L	1	VMS7993	VXX14625	
4-Chlorotoluene	ND	1.00	0.310	ug/L	1	VMS7993	VXX14625	
1,1,2,2-Tetrachloroethane	ND	0.500	0.150	ug/L	1	VMS7993	VXX14625	
1,3,5-Trimethylbenzene	ND	1.00	0.310	ug/L	1	VMS7993	VXX14625	
tert-Butylbenzene	ND	1.00	0.310	ug/L	1	VMS7993	VXX14625	
1,2,4-Trimethylbenzene	ND	1.00	0.310	ug/L	1	VMS7993	VXX14625	
sec-Butylbenzene	ND	1.00	0.310	ug/L	1	VMS7993	VXX14625	
4-Isopropyltoluene	ND	1.00	0.310	ug/L	1	VMS7993	VXX14625	
1,4-Dichlorobenzene	ND	0.500	0.150	ug/L	1	VMS7993	VXX14625	
1,2-Dichlorobenzene	ND	1.00	0.310	ug/L	1	VMS7993	VXX14625	
n-Butylbenzene	ND	1.00	0.310	ug/L	1	VMS7993	VXX14625	
1,3-Dichlorobenzene	ND	1.00	0.310	ug/L	1	VMS7993	VXX14625	
1,2-Dibromo-3-chloropropane	ND	2.00	0.620	ug/L	1	VMS7993	VXX14625	
1,2,4-Trichlorobenzene	ND	1.00	0.310	ug/L	1	VMS7993	VXX14625	
Hexachlorobutadiene	ND	1.00	0.310	ug/L	1	VMS7993	VXX14625	
Naphthalene	ND	2.00	0.620	ug/L	1	VMS7993	VXX14625	
1,2,3-Trichlorobenzene	ND	1.00	0.310	ug/L	1	VMS7993	VXX14625	
4-Methyl-2-pentanone (MIBK)	ND	10.0	3.10	ug/L	1	VMS7993	VXX14625	
2-Hexanone	ND	10.0	3.10	ug/L	1	VMS7993	VXX14625	
Methyl-t-butyl ether	ND	5.00	1.50	ug/L	1	VMS7993	VXX14625	
1,2-Dichloroethane	ND	0.500	0.150	ug/L	1	VMS7993	VXX14625	
Dibromofluoromethane <surr>	99.4	85-115		%	1	VMS7993	VXX14625	
1,2-Dichloroethane-D4 <surr>	102	72-119		%	1	VMS7993	VXX14625	
Toluene-d8 <surr>	104	85-120		%	1	VMS7993	VXX14625	
4-Bromofluorobenzene <surr>	109	76-119		%	1	VMS7993	VXX14625	



Satori Group, Inc.

Print Date: 11/15/2005

Client Sample ID: **0510FROAWA-01**
SGS Ref. #: 1057045001
Project ID: Ft Richardson Groundwater
Matrix: Water (Surface, Eff., Ground)

All Dates/Times are Alaska Local Time
Collection Date/Time: 10/18/05 10:35
Receipt Date/Time: 10/20/05 11:53
Location: AP-3871

Volatile Gas Chromatography/Mass Spectroscopy

<u>Parameter</u>	<u>Result</u>	<u>PQL/CL</u>	<u>MDL</u>	<u>Units</u>	<u>DF</u>	<u>Analytical Batch</u>	<u>Prep Batch</u>	<u>Qualifiers</u>
Batch Information								
Analytical Batch: VMS7993			Prep Batch: VXX14625				Initial Prep Wt./Vol.: 5 mL	
Analytical Method: SW8260B			Prep Method: SW5030B				Prep Extract Vol.: 5 mL	
Analysis Date/Time: 10/28/05 18:10			Prep Date/Time: 10/28/05 10:00				Container ID:1057045001-A	
Dilution Factor: 1							Analyst: VS	



Satori Group, Inc.

Print Date: 11/15/2005

Client Sample ID: 0510FROAWA-02
SGS Ref. #: 1057045002
Project ID: Ft Richardson Groundwater
Matrix: Water (Surface, Eff., Ground)

All Dates/Times are Alaska Local Time
Collection Date/Time: 10/18/05 12:30
Receipt Date/Time: 10/20/05 11:53
Location: AP-3774

Dissolved Metals

<u>Parameter</u>	<u>Result</u>	<u>PQL/CL</u>	<u>MDL</u>	<u>Units</u>	<u>DF</u>	<u>Analytical Batch</u>	<u>Prep Batch</u>	<u>Qualifiers</u>
Aluminum	ND	100	31.0	ug/L	5	MMS3861	MXX16522	
Arsenic	ND	10.0	3.10	ug/L	5	MMS3861	MXX16522	
Iron	ND	1000	310	ug/L	5	MMS3861	MXX16522	
Manganese	ND	2.00	0.620	ug/L	5	MMS3861	MXX16522	

Batch Information

Analytical Batch: MMS3861
Analytical Method: SW6020 Diss.
Analysis Date/Time: 10/28/05 12:49
Dilution Factor: 5

Prep Batch: MXX16522
Prep Method: FILTER
Prep Date/Time: 10/18/05 12:30

Initial Prep Wt./Vol.: 100 mL
Prep Extract Vol.: 100 mL
Container ID: 1057045002-I
Analyst: TK



Satori Group, Inc.

Print Date: 11/15/2005

Client Sample ID: 0510FROAWA-02
SGS Ref. #: 1057045002
Project ID: Ft Richardson Groundwater
Matrix: Water (Surface, Eff., Ground)

All Dates/Times are Alaska Local Time
Collection Date/Time: 10/18/05 12:30
Receipt Date/Time: 10/20/05 11:53
Location: AP-3774

Waters Department

<u>Parameter</u>	<u>Result</u>	<u>PQL/CL</u>	<u>MDL</u>	<u>Units</u>	<u>DF</u>	<u>Analytical Batch</u>	<u>Prep Batch</u>	<u>Qualifiers</u>
Total Nitrate/Nitrite-N	1.84	0.100	0.0310	mg/L	5	WFI1073		
Sulfate	25.6	0.100	0.0310	mg/L	1	WIC3768		

Batch Information

Analytical Batch: WFI1073 Initial Prep Wt./Vol.: 100 mL
 Analytical Method: EPA 353.2
 Analysis Date/Time: 10/20/05 16:53 Container ID:1057045002-G
 Dilution Factor: 5 Analyst: AZS

Analytical Batch: WIC3768 Initial Prep Wt./Vol.: 5 mL
 Analytical Method: EPA 300.0
 Analysis Date/Time: 10/21/05 11:34 Container ID:1057045002-H
 Dilution Factor: 1 Analyst: JEM



Satori Group, Inc.

Print Date: 11/15/2005

Client Sample ID: 0510FROAWA-02
SGS Ref. #: 1057045002
Project ID: Ft Richardson Groundwater
Matrix: Water (Surface, Eff., Ground)

All Dates/Times are Alaska Local Time
Collection Date/Time: 10/18/05 12:30
Receipt Date/Time: 10/20/05 11:53
Location: AP-3774

Light Gases

<u>Parameter</u>	<u>Result</u>	<u>PQL/CL</u>	<u>MDL</u>	<u>Units</u>	<u>DF</u>	<u>Analytical Batch</u>	<u>Prep Batch</u>	<u>Qualifiers</u>
Methane	ND	5.00	1.50	ug/L	1	GAS1262		

Batch Information

Analytical Batch: GAS1262
Analytical Method: RSK-175
Analysis Date/Time: 10/27/05 13:14
Dilution Factor: 1

Initial Prep Wt./Vol.: 1 mL
Container ID: 1057045002-D
Analyst: KWM



Satori Group, Inc.

Print Date: 11/15/2005

Client Sample ID: **0510FROAWA-02**
 SGS Ref. #: 1057045002
 Project ID: Ft Richardson Groundwater
 Matrix: Water (Surface, Eff., Ground)

All Dates/Times are Alaska Local Time
 Collection Date/Time: 10/18/05 12:30
 Receipt Date/Time: 10/20/05 11:53
 Location: AP-3774

Volatile Gas Chromatography/Mass Spectroscopy

<u>Parameter</u>	<u>Result</u>	<u>PQL/CL</u>	<u>MDL</u>	<u>Units</u>	<u>DF</u>	<u>Analytical Batch</u>	<u>Prep Batch</u>	<u>Qualifiers</u>
Dichlorodifluoromethane	ND	1.00	0.310	ug/L	1	VMS7993	VXX14625	
Chloromethane	ND	1.00	0.310	ug/L	1	VMS7993	VXX14625	
Vinyl chloride	ND	1.00	0.310	ug/L	1	VMS7993	VXX14625	
Bromomethane	ND	3.00	0.940	ug/L	1	VMS7993	VXX14625	
Chloroethane	ND	1.00	0.310	ug/L	1	VMS7993	VXX14625	
1,1-Dichloroethene	ND	1.00	0.310	ug/L	1	VMS7993	VXX14625	
Trichlorofluoromethane	ND	1.00	0.310	ug/L	1	VMS7993	VXX14625	
Methylene chloride	ND	5.00	1.00	ug/L	1	VMS7993	VXX14625	
Carbon disulfide	ND	2.00	0.620	ug/L	1	VMS7993	VXX14625	
Acetone	ND	10.0	3.10	ug/L	1	VMS7993	VXX14625	
trans-1,2-Dichloroethene	ND	1.00	0.310	ug/L	1	VMS7993	VXX14625	
1,1-Dichloroethane	ND	1.00	0.310	ug/L	1	VMS7993	VXX14625	
2,2-Dichloropropane	ND	1.00	0.310	ug/L	1	VMS7993	VXX14625	
cis-1,2-Dichloroethene	ND	1.00	0.310	ug/L	1	VMS7993	VXX14625	
2-Butanone (MEK)	ND	10.0	3.10	ug/L	1	VMS7993	VXX14625	
Bromochloromethane	ND	1.00	0.310	ug/L	1	VMS7993	VXX14625	
Chloroform	ND	1.00	0.300	ug/L	1	VMS7993	VXX14625	
1,1,1-Trichloroethane	ND	1.00	0.310	ug/L	1	VMS7993	VXX14625	
Carbon tetrachloride	0.390 J	1.00	0.310	ug/L	1	VMS7993	VXX14625	
1,1-Dichloropropene	ND	1.00	0.310	ug/L	1	VMS7993	VXX14625	
Benzene	ND	0.400	0.120	ug/L	1	VMS7993	VXX14625	
Trichloroethene	0.710 J	1.00	0.310	ug/L	1	VMS7993	VXX14625	
1,2-Dichloropropane	ND	1.00	0.310	ug/L	1	VMS7993	VXX14625	
Dibromomethane	ND	1.00	0.310	ug/L	1	VMS7993	VXX14625	
Bromodichloromethane	ND	0.500	0.150	ug/L	1	VMS7993	VXX14625	
2-Chloroethyl Vinyl Ether	ND	10.0	3.10	ug/L	1	VMS7993	VXX14625	
cis-1,3-Dichloropropene	ND	0.500	0.150	ug/L	1	VMS7993	VXX14625	
Toluene	ND	1.00	0.310	ug/L	1	VMS7993	VXX14625	
trans-1,3-Dichloropropene	ND	1.00	0.310	ug/L	1	VMS7993	VXX14625	
1,1,2-Trichloroethane	ND	1.00	0.310	ug/L	1	VMS7993	VXX14625	
Tetrachloroethene	0.330 J	1.00	0.310	ug/L	1	VMS7993	VXX14625	
1,3-Dichloropropane	ND	0.400	0.120	ug/L	1	VMS7993	VXX14625	
Dibromochloromethane	ND	0.500	0.150	ug/L	1	VMS7993	VXX14625	
1,2-Dibromoethane	ND	1.00	0.310	ug/L	1	VMS7993	VXX14625	
Chlorobenzene	ND	0.500	0.150	ug/L	1	VMS7993	VXX14625	
1,1,1,2-Tetrachloroethane	ND	0.500	0.150	ug/L	1	VMS7993	VXX14625	
Ethylbenzene	ND	1.00	0.310	ug/L	1	VMS7993	VXX14625	



Satori Group, Inc.

Print Date: 11/15/2005

Client Sample ID: 0510FROAWA-02
SGS Ref. #: 1057045002
Project ID: Ft Richardson Groundwater
Matrix: Water (Surface, Eff., Ground)

All Dates/Times are Alaska Local Time
Collection Date/Time: 10/18/05 12:30
Receipt Date/Time: 10/20/05 11:53
Location: AP-3774

Volatile Gas Chromatography/Mass Spectroscopy

<u>Parameter</u>	<u>Result</u>	<u>PQL/CL</u>	<u>MDL</u>	<u>Units</u>	<u>DF</u>	<u>Analytical Batch</u>	<u>Prep Batch</u>	<u>Qualifiers</u>
P & M -Xylene	ND	2.00	0.620	ug/L	1	VMS7993	VXX14625	
Styrene	ND	1.00	0.310	ug/L	1	VMS7993	VXX14625	
Bromoform	ND	1.00	0.310	ug/L	1	VMS7993	VXX14625	
Isopropylbenzene (Cumene)	ND	1.00	0.310	ug/L	1	VMS7993	VXX14625	
Bromobenzene	ND	1.00	0.310	ug/L	1	VMS7993	VXX14625	
o-Xylene	ND	1.00	0.310	ug/L	1	VMS7993	VXX14625	
1,1,2,2-Tetrachloroethane	ND	0.500	0.150	ug/L	1	VMS7993	VXX14625	
1,2,3-Trichloropropane	ND	1.00	0.310	ug/L	1	VMS7993	VXX14625	
n-Propylbenzene	ND	1.00	0.310	ug/L	1	VMS7993	VXX14625	
2-Chlorotoluene	ND	1.00	0.310	ug/L	1	VMS7993	VXX14625	
4-Chlorotoluene	ND	1.00	0.310	ug/L	1	VMS7993	VXX14625	
1,3,5-Trimethylbenzene	ND	1.00	0.310	ug/L	1	VMS7993	VXX14625	
tert-Butylbenzene	ND	1.00	0.310	ug/L	1	VMS7993	VXX14625	
1,2,4-Trimethylbenzene	ND	1.00	0.310	ug/L	1	VMS7993	VXX14625	
sec-Butylbenzene	ND	1.00	0.310	ug/L	1	VMS7993	VXX14625	
4-Isopropyltoluene	ND	1.00	0.310	ug/L	1	VMS7993	VXX14625	
1,4-Dichlorobenzene	ND	0.500	0.150	ug/L	1	VMS7993	VXX14625	
1,2-Dichlorobenzene	ND	1.00	0.310	ug/L	1	VMS7993	VXX14625	
1,3-Dichlorobenzene	ND	1.00	0.310	ug/L	1	VMS7993	VXX14625	
n-Butylbenzene	ND	1.00	0.310	ug/L	1	VMS7993	VXX14625	
1,2-Dibromo-3-chloropropane	ND	2.00	0.620	ug/L	1	VMS7993	VXX14625	
1,2,4-Trichlorobenzene	ND	1.00	0.310	ug/L	1	VMS7993	VXX14625	
Hexachlorobutadiene	ND	1.00	0.310	ug/L	1	VMS7993	VXX14625	
Naphthalene	ND	2.00	0.620	ug/L	1	VMS7993	VXX14625	
1,2,3-Trichlorobenzene	ND	1.00	0.310	ug/L	1	VMS7993	VXX14625	
4-Methyl-2-pentanone (MIBK)	ND	10.0	3.10	ug/L	1	VMS7993	VXX14625	
2-Hexanone	ND	10.0	3.10	ug/L	1	VMS7993	VXX14625	
Methyl-t-butyl ether	ND	5.00	1.50	ug/L	1	VMS7993	VXX14625	
1,2-Dichloroethane	ND	0.500	0.150	ug/L	1	VMS7993	VXX14625	
Dibromofluoromethane <surr>	101	85-115		%	1	VMS7993	VXX14625	
1,2-Dichloroethane-D4 <surr>	104	72-119		%	1	VMS7993	VXX14625	
Toluene-d8 <surr>	105	85-120		%	1	VMS7993	VXX14625	
4-Bromofluorobenzene <surr>	111	76-119		%	1	VMS7993	VXX14625	



Satori Group, Inc.

Print Date: 11/15/2005

Client Sample ID: 0510FROAWA-02
SGS Ref. #: 1057045002
Project ID: Ft Richardson Groundwater
Matrix: Water (Surface, Eff., Ground)

All Dates/Times are Alaska Local Time
Collection Date/Time: 10/18/05 12:30
Receipt Date/Time: 10/20/05 11:53
Location: AP-3774

Volatile Gas Chromatography/Mass Spectroscopy

<u>Parameter</u>	<u>Result</u>	<u>PQL/CL</u>	<u>MDL</u>	<u>Units</u>	<u>DF</u>	<u>Analytical Batch</u>	<u>Prep Batch</u>	<u>Qualifiers</u>
Batch Information								
Analytical Batch: VMS7993			Prep Batch: VXX14625				Initial Prep Wt./Vol.: 5 mL	
Analytical Method: SW8260B			Prep Method: SW5030B				Prep Extract Vol.: 5 mL	
Analysis Date/Time: 10/28/05 18:46			Prep Date/Time: 10/28/05 10:00				Container ID:1057045002-A	
Dilution Factor: 1							Analyst: VS	



Satori Group, Inc.

Print Date: 11/15/2005

Client Sample ID: **0510FROAWA-03**
SGS Ref. #: 1057045003
Project ID: Ft Richardson Groundwater
Matrix: Water (Surface, Eff., Ground)

All Dates/Times are Alaska Local Time
Collection Date/Time: 10/18/05 15:30
Receipt Date/Time: 10/20/05 11:53
Location: AP-3893

Dissolved Metals

<u>Parameter</u>	<u>Result</u>	<u>PQL/CL</u>	<u>MDL</u>	<u>Units</u>	<u>DF</u>	<u>Analytical</u> <u>Batch</u>	<u>Prep</u> <u>Batch</u>	<u>Qualifiers</u>
Aluminum	ND	100	31.0	ug/L	5	MMS3863	MXX16524	
Arsenic	13.5	10.0	3.10	ug/L	5	MMS3863	MXX16524	
Iron	ND	1000	310	ug/L	5	MMS3863	MXX16524	
Manganese	26.2	2.00	0.620	ug/L	5	MMS3863	MXX16524	

Batch Information

Analytical Batch: MMS3863
Analytical Method: SW6020 Diss.
Analysis Date/Time: 10/31/05 14:14
Dilution Factor: 5

Prep Batch: MXX16524
Prep Method: FILTER
Prep Date/Time: 10/18/05 15:30

Initial Prep Wt./Vol.: 100 mL
Prep Extract Vol.: 100 mL
Container ID: 1057045003-I
Analyst: TK



Satori Group, Inc.

Print Date: 11/15/2005

Client Sample ID: 0510FROAWA-03
SGS Ref. #: 1057045003
Project ID: Ft Richardson Groundwater
Matrix: Water (Surface, Eff., Ground)

All Dates/Times are Alaska Local Time
Collection Date/Time: 10/18/05 15:30
Receipt Date/Time: 10/20/05 11:53
Location: AP-3893

Waters Department

<u>Parameter</u>	<u>Result</u>	<u>PQL/CL</u>	<u>MDL</u>	<u>Units</u>	<u>DF</u>	<u>Analytical Batch</u>	<u>Prep Batch</u>	<u>Qualifiers</u>
Sulfate	18.5	0.100	0.0310	mg/L	1	WIC3768		
Total Nitrate/Nitrite-N	0.144	0.100	0.0310	mg/L	5	WFI1073		

Batch Information

Analytical Batch: WFI1073	Initial Prep Wt./Vol.: 100 mL
Analytical Method: EPA 353.2	
Analysis Date/Time: 10/20/05 16:55	Container ID:1057045003-G
Dilution Factor: 5	Analyst: AZS
<hr/>	
Analytical Batch: WIC3768	Initial Prep Wt./Vol.: 5 mL
Analytical Method: EPA 300.0	
Analysis Date/Time: 10/21/05 11:52	Container ID:1057045003-H
Dilution Factor: 1	Analyst: JEM



Satori Group, Inc.

Print Date: 11/15/2005

Client Sample ID: **0510FROAWA-03**
SGS Ref. #: 1057045003
Project ID: Ft Richardson Groundwater
Matrix: Water (Surface, Eff., Ground)

All Dates/Times are Alaska Local Time
Collection Date/Time: 10/18/05 15:30
Receipt Date/Time: 10/20/05 11:53
Location: AP-3893

Light Gases

<u>Parameter</u>	<u>Result</u>	<u>PQL/CL</u>	<u>MDL</u>	<u>Units</u>	<u>DF</u>	<u>Analytical Batch</u>	<u>Prep Batch</u>	<u>Qualifiers</u>
Methane	ND	5.00	1.50	ug/L	1	GAS1262		

Batch Information

Analytical Batch: GAS1262
Analytical Method: RSK-175
Analysis Date/Time: 10/27/05 13:21
Dilution Factor: 1

Initial Prep Wt./Vol.: 1 mL
Container ID:1057045003-D
Analyst: KWM



Satori Group, Inc.

Print Date: 11/15/2005

Client Sample ID: 0510FROAWA-03
SGS Ref. #: 1057045003
Project ID: Ft Richardson Groundwater
Matrix: Water (Surface, Eff., Ground)

All Dates/Times are Alaska Local Time
Collection Date/Time: 10/18/05 15:30
Receipt Date/Time: 10/20/05 11:53
Location: AP-3893

Volatile Gas Chromatography/Mass Spectroscopy

<u>Parameter</u>	<u>Result</u>	<u>PQL/CL</u>	<u>MDL</u>	<u>Units</u>	<u>DF</u>	<u>Analytical</u> <u>Batch</u>	<u>Prep</u> <u>Batch</u>	<u>Qualifiers</u>
Dichlorodifluoromethane	ND	1.00	0.310	ug/L	1	VMS7993	VXX14625	
Chloromethane	ND	1.00	0.310	ug/L	1	VMS7993	VXX14625	
Vinyl chloride	ND	1.00	0.310	ug/L	1	VMS7993	VXX14625	
Bromomethane	ND	3.00	0.940	ug/L	1	VMS7993	VXX14625	
Chloroethane	ND	1.00	0.310	ug/L	1	VMS7993	VXX14625	
1,1-Dichloroethene	ND	1.00	0.310	ug/L	1	VMS7993	VXX14625	
Trichlorofluoromethane	ND	1.00	0.310	ug/L	1	VMS7993	VXX14625	
Methylene chloride	ND	5.00	1.00	ug/L	1	VMS7993	VXX14625	
Carbon disulfide	ND	2.00	0.620	ug/L	1	VMS7993	VXX14625	
Acetone	ND	10.0	3.10	ug/L	1	VMS7993	VXX14625	
trans-1,2-Dichloroethene	ND	1.00	0.310	ug/L	1	VMS7993	VXX14625	
1,1-Dichloroethane	ND	1.00	0.310	ug/L	1	VMS7993	VXX14625	
2,2-Dichloropropane	ND	1.00	0.310	ug/L	1	VMS7993	VXX14625	
cis-1,2-Dichloroethene	ND	1.00	0.310	ug/L	1	VMS7993	VXX14625	
2-Butanone (MEK)	ND	10.0	3.10	ug/L	1	VMS7993	VXX14625	
Bromochloromethane	ND	1.00	0.310	ug/L	1	VMS7993	VXX14625	
Chloroform	ND	1.00	0.300	ug/L	1	VMS7993	VXX14625	
1,1,1-Trichloroethane	ND	1.00	0.310	ug/L	1	VMS7993	VXX14625	
Carbon tetrachloride	ND	1.00	0.310	ug/L	1	VMS7993	VXX14625	
1,1-Dichloropropene	ND	1.00	0.310	ug/L	1	VMS7993	VXX14625	
Benzene	ND	0.400	0.120	ug/L	1	VMS7993	VXX14625	
Trichloroethene	ND	1.00	0.310	ug/L	1	VMS7993	VXX14625	
1,2-Dichloropropane	ND	1.00	0.310	ug/L	1	VMS7993	VXX14625	
Dibromomethane	ND	1.00	0.310	ug/L	1	VMS7993	VXX14625	
Bromodichloromethane	ND	0.500	0.150	ug/L	1	VMS7993	VXX14625	
2-Chloroethyl Vinyl Ether	ND	10.0	3.10	ug/L	1	VMS7993	VXX14625	
cis-1,3-Dichloropropene	ND	0.500	0.150	ug/L	1	VMS7993	VXX14625	
Toluene	ND	1.00	0.310	ug/L	1	VMS7993	VXX14625	
trans-1,3-Dichloropropene	ND	1.00	0.310	ug/L	1	VMS7993	VXX14625	
1,1,2-Trichloroethane	ND	1.00	0.310	ug/L	1	VMS7993	VXX14625	
Tetrachloroethene	ND	1.00	0.310	ug/L	1	VMS7993	VXX14625	
1,3-Dichloropropane	ND	0.400	0.120	ug/L	1	VMS7993	VXX14625	
Dibromochloromethane	ND	0.500	0.150	ug/L	1	VMS7993	VXX14625	
1,2-Dibromoethane	ND	1.00	0.310	ug/L	1	VMS7993	VXX14625	
Chlorobenzene	ND	0.500	0.150	ug/L	1	VMS7993	VXX14625	
1,1,1,2-Tetrachloroethane	ND	0.500	0.150	ug/L	1	VMS7993	VXX14625	
Ethylbenzene	ND	1.00	0.310	ug/L	1	VMS7993	VXX14625	



Satori Group, Inc.

Print Date: 11/15/2005

Client Sample ID: 0510FROAWA-03
 SGS Ref. #: 1057045003
 Project ID: Ft Richardson Groundwater
 Matrix: Water (Surface, Eff., Ground)

All Dates/Times are Alaska Local Time
 Collection Date/Time: 10/18/05 15:30
 Receipt Date/Time: 10/20/05 11:53
 Location: AP-3893

Volatile Gas Chromatography/Mass Spectroscopy

Parameter	Result	PQL/CL	MDL	Units	DF	Analytical	Prep	Qualifiers
						Batch	Batch	
P & M -Xylene	ND	2.00	0.620	ug/L	1	VMS7993	VXX14625	
Styrene	ND	1.00	0.310	ug/L	1	VMS7993	VXX14625	
Bromoform	ND	1.00	0.310	ug/L	1	VMS7993	VXX14625	
Isopropylbenzene (Cumene)	ND	1.00	0.310	ug/L	1	VMS7993	VXX14625	
Bromobenzene	ND	1.00	0.310	ug/L	1	VMS7993	VXX14625	
o-Xylene	ND	1.00	0.310	ug/L	1	VMS7993	VXX14625	
1,1,2,2-Tetrachloroethane	ND	0.500	0.150	ug/L	1	VMS7993	VXX14625	
1,2,3-Trichloropropane	ND	1.00	0.310	ug/L	1	VMS7993	VXX14625	
n-Propylbenzene	ND	1.00	0.310	ug/L	1	VMS7993	VXX14625	
2-Chlorotoluene	ND	1.00	0.310	ug/L	1	VMS7993	VXX14625	
4-Chlorotoluene	ND	1.00	0.310	ug/L	1	VMS7993	VXX14625	
1,3,5-Trimethylbenzene	ND	1.00	0.310	ug/L	1	VMS7993	VXX14625	
tert-Butylbenzene	ND	1.00	0.310	ug/L	1	VMS7993	VXX14625	
1,2,4-Trimethylbenzene	ND	1.00	0.310	ug/L	1	VMS7993	VXX14625	
sec-Butylbenzene	ND	1.00	0.310	ug/L	1	VMS7993	VXX14625	
4-Isopropyltoluene	ND	1.00	0.310	ug/L	1	VMS7993	VXX14625	
1,4-Dichlorobenzene	ND	0.500	0.150	ug/L	1	VMS7993	VXX14625	
1,2-Dichlorobenzene	ND	1.00	0.310	ug/L	1	VMS7993	VXX14625	
1,3-Dichlorobenzene	ND	1.00	0.310	ug/L	1	VMS7993	VXX14625	
n-Butylbenzene	ND	1.00	0.310	ug/L	1	VMS7993	VXX14625	
1,2-Dibromo-3-chloropropane	ND	2.00	0.620	ug/L	1	VMS7993	VXX14625	
1,2,4-Trichlorobenzene	ND	1.00	0.310	ug/L	1	VMS7993	VXX14625	
Hexachlorobutadiene	ND	1.00	0.310	ug/L	1	VMS7993	VXX14625	
Naphthalene	ND	2.00	0.620	ug/L	1	VMS7993	VXX14625	
1,2,3-Trichlorobenzene	ND	1.00	0.310	ug/L	1	VMS7993	VXX14625	
4-Methyl-2-pentanone (MIBK)	ND	10.0	3.10	ug/L	1	VMS7993	VXX14625	
2-Hexanone	ND	10.0	3.10	ug/L	1	VMS7993	VXX14625	
Methyl-t-butyl ether	ND	5.00	1.50	ug/L	1	VMS7993	VXX14625	
1,2-Dichloroethane	ND	0.500	0.150	ug/L	1	VMS7993	VXX14625	
Dibromofluoromethane <surr>	98.5	85-115		%	1	VMS7993	VXX14625	
1,2-Dichloroethane-D4 <surr>	103	72-119		%	1	VMS7993	VXX14625	
Toluene-d8 <surr>	103	85-120		%	1	VMS7993	VXX14625	
4-Bromofluorobenzene <surr>	111	76-119		%	1	VMS7993	VXX14625	



Satori Group, Inc.

Print Date: 11/15/2005

Client Sample ID: 0510FROAWA-03
SGS Ref. #: 1057045003
Project ID: Ft Richardson Groundwater
Matrix: Water (Surface, Eff., Ground)

All Dates/Times are Alaska Local Time
Collection Date/Time: 10/18/05 15:30
Receipt Date/Time: 10/20/05 11:53
Location: AP-3893

Volatile Gas Chromatography/Mass Spectroscopy

<u>Parameter</u>	<u>Result</u>	<u>PQL/CL</u>	<u>MDL</u>	<u>Units</u>	<u>DF</u>	<u>Analytical Batch</u>	<u>Prep Batch</u>	<u>Qualifiers</u>
Batch Information								
Analytical Batch: VMS7993			Prep Batch: VXX14625				Initial Prep Wt./Vol.: 5 mL	
Analytical Method: SW8260B			Prep Method: SW5030B				Prep Extract Vol.: 5 mL	
Analysis Date/Time: 10/29/05 01:21			Prep Date/Time: 10/28/05 10:00				Container ID:1057045003-C	
Dilution Factor: 1							Analyst: VS	



Satori Group, Inc.

Print Date: 11/15/2005

Client Sample ID: 0510FROAWA-03
SGS Ref. #: 1057045003
Project ID: Ft Richardson Groundwater
Matrix: Water (Surface, Eff., Ground)

All Dates/Times are Alaska Local Time
Collection Date/Time: 10/18/05 15:30
Receipt Date/Time: 10/20/05 11:53
Location: AP-3893

Polynuclear Aromatics GC/MS

Parameter	Result	PQL/CL	MDL	Units	DF	Analytical Batch	Prep Batch	Qualifiers
Acenaphthylene	ND	0.0500	0.0150	ug/L	1	XMS3493	XXX16058	
2-Methylnaphthalene	ND	0.0500	0.0150	ug/L	1	XMS3493	XXX16058	
Acenaphthene	ND	0.0500	0.0150	ug/L	1	XMS3493	XXX16058	
Fluorene	ND	0.0500	0.0150	ug/L	1	XMS3493	XXX16058	
Phenanthrene	ND	0.0500	0.0150	ug/L	1	XMS3493	XXX16058	
Anthracene	ND	0.0500	0.0150	ug/L	1	XMS3493	XXX16058	
Fluoranthene	ND	0.0500	0.0150	ug/L	1	XMS3493	XXX16058	
Pyrene	ND	0.0500	0.0150	ug/L	1	XMS3493	XXX16058	
Benzo(a)Anthracene	ND	0.0500	0.0150	ug/L	1	XMS3493	XXX16058	
Chrysene	ND	0.0500	0.0150	ug/L	1	XMS3493	XXX16058	
Benzo[b]Fluoranthene	ND	0.0500	0.0150	ug/L	1	XMS3493	XXX16058	
Benzo[a]pyrene	ND	0.0500	0.0150	ug/L	1	XMS3493	XXX16058	
Indeno[1,2,3-c,d] pyrene	ND	0.0500	0.0150	ug/L	1	XMS3493	XXX16058	
Dibenzo[a,h]anthracene	ND	0.0500	0.0100	ug/L	1	XMS3493	XXX16058	
Benzo[g,h,i]perylene	ND	0.0500	0.0150	ug/L	1	XMS3493	XXX16058	
Naphthalene	ND	0.100	0.0310	ug/L	1	XMS3493	XXX16058	
1-Methylnaphthalene	ND	0.0500	0.0150	ug/L	1	XMS3493	XXX16058	
Benzo[k]fluoranthene	ND	0.0500	0.0150	ug/L	1	XMS3493	XXX16058	
Terphenyl-d14 <sur>	63.9	50-120		%	1	XMS3493	XXX16058	

Batch Information

Analytical Batch: XMS3493	Prep Batch: XXX16058	Initial Prep Wt./Vol.: 1000 mL
Analytical Method: 8270C SIMS	Prep Method: SW3510C	Prep Extract Vol.: 1 mL
Analysis Date/Time: 11/04/05 13:18	Prep Date/Time: 10/24/05 10:00	Container ID: 1057045003-K
Dilution Factor: 1		Analyst: SPM



Satori Group, Inc.

Print Date: 11/15/2005

Client Sample ID: **0510FROAWA-04**
SGS Ref. #: 1057045004
Project ID: Ft Richardson Groundwater
Matrix: Water (Surface, Eff., Ground)

All Dates/Times are Alaska Local Time
Collection Date/Time: 10/18/05 17:00
Receipt Date/Time: 10/20/05 11:53
Location: AP-3468

Dissolved Metals

<u>Parameter</u>	<u>Result</u>	<u>PQL/CL</u>	<u>MDL</u>	<u>Units</u>	<u>DF</u>	<u>Analytical Batch</u>	<u>Prep Batch</u>	<u>Qualifiers</u>
Aluminum	ND	100	31.0	ug/L	5	MMS3863	MXX16524	
Arsenic	ND	10.0	3.10	ug/L	5	MMS3863	MXX16524	
Iron	ND	1000	310	ug/L	5	MMS3863	MXX16524	
Manganese	ND	2.00	0.620	ug/L	5	MMS3863	MXX16524	

Batch Information

Analytical Batch: MMS3863
Analytical Method: SW6020 Diss.
Analysis Date/Time: 10/31/05 14:18
Dilution Factor: 5

Prep Batch: MXX16524
Prep Method: FILTER
Prep Date/Time: 10/18/05 17:00

Initial Prep Wt./Vol.: 100 mL
Prep Extract Vol.: 100 mL
Container ID:1057045004-I
Analyst: TK



Satori Group, Inc.

Print Date: 11/15/2005

Client Sample ID: **0510FROAWA-04**
SGS Ref. #: 1057045004
Project ID: Ft Richardson Groundwater
Matrix: Water (Surface, Eff., Ground)

All Dates/Times are Alaska Local Time
Collection Date/Time: 10/18/05 17:00
Receipt Date/Time: 10/20/05 11:53
Location: AP-3468

Waters Department

<u>Parameter</u>	<u>Result</u>	<u>PQL/CL</u>	<u>MDL</u>	<u>Units</u>	<u>DF</u>	<u>Analytical Batch</u>	<u>Prep Batch</u>	<u>Qualifiers</u>
Total Nitrate/Nitrite-N	2.89	0.100	0.0310	mg/L	5	WF11073		
Sulfate	25.0	0.100	0.0310	mg/L	1	WIC3768		

Batch Information

Analytical Batch: WF11073	Initial Prep Wt./Vol.: 100 mL
Analytical Method: EPA 353.2	
Analysis Date/Time: 10/20/05 17:02	Container ID:1057045004-G
Dilution Factor: 5	Analyst: AZS
<hr/>	
Analytical Batch: WIC3768	Initial Prep Wt./Vol.: 5 mL
Analytical Method: EPA 300.0	
Analysis Date/Time: 10/21/05 12:10	Container ID:1057045004-H
Dilution Factor: 1	Analyst: JEM



Satori Group, Inc.

Print Date: 11/15/2005

Client Sample ID: 0510FROAWA-04
SGS Ref. #: 1057045004
Project ID: Ft Richardson Groundwater
Matrix: Water (Surface, Eff., Ground)

All Dates/Times are Alaska Local Time
Collection Date/Time: 10/18/05 17:00
Receipt Date/Time: 10/20/05 11:53
Location: AP-3468

Light Gases

<u>Parameter</u>	<u>Result</u>	<u>PQL/CL</u>	<u>MDL</u>	<u>Units</u>	<u>DF</u>	<u>Analytical Batch</u>	<u>Prep Batch</u>	<u>Qualifiers</u>
Methane	ND	5.00	1.50	ug/L	1	GAS1262		

Batch Information

Analytical Batch: GAS1262
Analytical Method: RSK-175
Analysis Date/Time: 10/27/05 13:42
Dilution Factor: 1

Initial Prep Wt./Vol.: 1 mL
Container ID: 1057045004-D
Analyst: KWM



Satori Group, Inc.

Print Date: 11/15/2005

Client Sample ID: **0510FROAWA-04**
SGS Ref. #: 1057045004
Project ID: Ft Richardson Groundwater
Matrix: Water (Surface, Eff., Ground)

All Dates/Times are Alaska Local Time
Collection Date/Time: 10/18/05 17:00
Receipt Date/Time: 10/20/05 11:53
Location: AP-3468

Volatile Gas Chromatography/Mass Spectroscopy

<u>Parameter</u>	<u>Result</u>	<u>PQL/CL</u>	<u>MDL</u>	<u>Units</u>	<u>DF</u>	<u>Analytical</u> <u>Batch</u>	<u>Prep</u> <u>Batch</u>	<u>Qualifiers</u>
Dichlorodifluoromethane	ND	1.00	0.310	ug/L	1	VMS7993	VXX14625	
Chloromethane	ND	1.00	0.310	ug/L	1	VMS7993	VXX14625	
Vinyl chloride	ND	1.00	0.310	ug/L	1	VMS7993	VXX14625	
Bromomethane	ND	3.00	0.940	ug/L	1	VMS7993	VXX14625	
Chloroethane	ND	1.00	0.310	ug/L	1	VMS7993	VXX14625	
Trichlorofluoromethane	ND	1.00	0.310	ug/L	1	VMS7993	VXX14625	
1,1-Dichloroethene	ND	1.00	0.310	ug/L	1	VMS7993	VXX14625	
Methylene chloride	ND	5.00	1.00	ug/L	1	VMS7993	VXX14625	
Carbon disulfide	ND	2.00	0.620	ug/L	1	VMS7993	VXX14625	
Acetone	ND	10.0	3.10	ug/L	1	VMS7993	VXX14625	
trans-1,2-Dichloroethene	ND	1.00	0.310	ug/L	1	VMS7993	VXX14625	
1,1-Dichloroethane	ND	1.00	0.310	ug/L	1	VMS7993	VXX14625	
2,2-Dichloropropane	ND	1.00	0.310	ug/L	1	VMS7993	VXX14625	
cis-1,2-Dichloroethene	ND	1.00	0.310	ug/L	1	VMS7993	VXX14625	
2-Butanone (MEK)	ND	10.0	3.10	ug/L	1	VMS7993	VXX14625	
Bromochloromethane	ND	1.00	0.310	ug/L	1	VMS7993	VXX14625	
Chloroform	0.320 J	1.00	0.300	ug/L	1	VMS7993	VXX14625	
1,1,1-Trichloroethane	ND	1.00	0.310	ug/L	1	VMS7993	VXX14625	
Carbon tetrachloride	ND	1.00	0.310	ug/L	1	VMS7993	VXX14625	
1,1-Dichloropropene	ND	1.00	0.310	ug/L	1	VMS7993	VXX14625	
Benzene	ND	0.400	0.120	ug/L	1	VMS7993	VXX14625	
Trichloroethene	ND	1.00	0.310	ug/L	1	VMS7993	VXX14625	
1,2-Dichloropropane	ND	1.00	0.310	ug/L	1	VMS7993	VXX14625	
Dibromomethane	ND	1.00	0.310	ug/L	1	VMS7993	VXX14625	
Bromodichloromethane	ND	0.500	0.150	ug/L	1	VMS7993	VXX14625	
2-Chloroethyl Vinyl Ether	ND	10.0	3.10	ug/L	1	VMS7993	VXX14625	
cis-1,3-Dichloropropene	ND	0.500	0.150	ug/L	1	VMS7993	VXX14625	
Toluene	ND	1.00	0.310	ug/L	1	VMS7993	VXX14625	
trans-1,3-Dichloropropene	ND	1.00	0.310	ug/L	1	VMS7993	VXX14625	
1,1,2-Trichloroethane	ND	1.00	0.310	ug/L	1	VMS7993	VXX14625	
Tetrachloroethene	59.4	1.00	0.310	ug/L	1	VMS7993	VXX14625	
1,3-Dichloropropane	ND	0.400	0.120	ug/L	1	VMS7993	VXX14625	
Dibromochloromethane	ND	0.500	0.150	ug/L	1	VMS7993	VXX14625	
1,2-Dibromoethane	ND	1.00	0.310	ug/L	1	VMS7993	VXX14625	
Chlorobenzene	ND	0.500	0.150	ug/L	1	VMS7993	VXX14625	
1,1,1,2-Tetrachloroethane	ND	0.500	0.150	ug/L	1	VMS7993	VXX14625	
Ethylbenzene	ND	1.00	0.310	ug/L	1	VMS7993	VXX14625	



Satori Group, Inc.

Print Date: 11/15/2005

Client Sample ID: 0510FROAWA-04
 SGS Ref. #: 1057045004
 Project ID: Ft Richardson Groundwater
 Matrix: Water (Surface, Eff., Ground)

All Dates/Times are Alaska Local Time
 Collection Date/Time: 10/18/05 17:00
 Receipt Date/Time: 10/20/05 11:53
 Location: AP-3468

Volatile Gas Chromatography/Mass Spectroscopy

<u>Parameter</u>	<u>Result</u>	<u>PQL/CL</u>	<u>MDL</u>	<u>Units</u>	<u>DF</u>	<u>Analytical Batch</u>	<u>Prep Batch</u>	<u>Qualifiers</u>
P & M -Xylene	ND	2.00	0.620	ug/L	1	VMS7993	VXX14625	
Styrene	ND	1.00	0.310	ug/L	1	VMS7993	VXX14625	
Bromoform	ND	1.00	0.310	ug/L	1	VMS7993	VXX14625	
Isopropylbenzene (Cumene)	ND	1.00	0.310	ug/L	1	VMS7993	VXX14625	
Bromobenzene	ND	1.00	0.310	ug/L	1	VMS7993	VXX14625	
o-Xylene	ND	1.00	0.310	ug/L	1	VMS7993	VXX14625	
1,2,3-Trichloropropane	ND	1.00	0.310	ug/L	1	VMS7993	VXX14625	
n-Propylbenzene	ND	1.00	0.310	ug/L	1	VMS7993	VXX14625	
2-Chlorotoluene	ND	1.00	0.310	ug/L	1	VMS7993	VXX14625	
1,1,2,2-Tetrachloroethane	ND	0.500	0.150	ug/L	1	VMS7993	VXX14625	
4-Chlorotoluene	ND	1.00	0.310	ug/L	1	VMS7993	VXX14625	
1,3,5-Trimethylbenzene	ND	1.00	0.310	ug/L	1	VMS7993	VXX14625	
tert-Butylbenzene	ND	1.00	0.310	ug/L	1	VMS7993	VXX14625	
1,2,4-Trimethylbenzene	ND	1.00	0.310	ug/L	1	VMS7993	VXX14625	
sec-Butylbenzene	ND	1.00	0.310	ug/L	1	VMS7993	VXX14625	
4-Isopropyltoluene	ND	1.00	0.310	ug/L	1	VMS7993	VXX14625	
1,4-Dichlorobenzene	ND	0.500	0.150	ug/L	1	VMS7993	VXX14625	
1,2-Dichlorobenzene	ND	1.00	0.310	ug/L	1	VMS7993	VXX14625	
1,3-Dichlorobenzene	ND	1.00	0.310	ug/L	1	VMS7993	VXX14625	
n-Butylbenzene	ND	1.00	0.310	ug/L	1	VMS7993	VXX14625	
1,2-Dibromo-3-chloropropane	ND	2.00	0.620	ug/L	1	VMS7993	VXX14625	
1,2,4-Trichlorobenzene	ND	1.00	0.310	ug/L	1	VMS7993	VXX14625	
Hexachlorobutadiene	ND	1.00	0.310	ug/L	1	VMS7993	VXX14625	
Naphthalene	ND	2.00	0.620	ug/L	1	VMS7993	VXX14625	
1,2,3-Trichlorobenzene	ND	1.00	0.310	ug/L	1	VMS7993	VXX14625	
4-Methyl-2-pentanone (MIBK)	ND	10.0	3.10	ug/L	1	VMS7993	VXX14625	
2-Hexanone	ND	10.0	3.10	ug/L	1	VMS7993	VXX14625	
Methyl-t-butyl ether	ND	5.00	1.50	ug/L	1	VMS7993	VXX14625	
1,2-Dichloroethane	ND	0.500	0.150	ug/L	1	VMS7993	VXX14625	
Dibromofluoromethane <surr>	102	85-115		%	1	VMS7993	VXX14625	
1,2-Dichloroethane-D4 <surr>	105	72-119		%	1	VMS7993	VXX14625	
Toluene-d8 <surr>	104	85-120		%	1	VMS7993	VXX14625	
4-Bromofluorobenzene <surr>	107	76-119		%	1	VMS7993	VXX14625	



Satori Group, Inc.

Print Date: 11/15/2005

Client Sample ID: 0510FROAWA-04
SGS Ref. #: 1057045004
Project ID: Ft Richardson Groundwater
Matrix: Water (Surface, Eff., Ground)

All Dates/Times are Alaska Local Time
Collection Date/Time: 10/18/05 17:00
Receipt Date/Time: 10/20/05 11:53
Location: AP-3468

Volatile Gas Chromatography/Mass Spectroscopy

<u>Parameter</u>	<u>Result</u>	<u>PQL/CL</u>	<u>MDL</u>	<u>Units</u>	<u>DF</u>	<u>Analytical Batch</u>	<u>Prep Batch</u>	<u>Qualifiers</u>
Batch Information								
Analytical Batch: VMS7993			Prep Batch: VXX14625				Initial Prep Wt./Vol.: 5 mL	
Analytical Method: SW8260B			Prep Method: SW5030B				Prep Extract Vol.: 5 mL	
Analysis Date/Time: 10/28/05 19:22			Prep Date/Time: 10/28/05 10:00				Container ID:1057045004-A	
Dilution Factor: 1							Analyst: VS	



Satori Group, Inc.

Print Date: 11/15/2005

Client Sample ID: **0510FROAWA-05**
SGS Ref. #: 1057045005
Project ID: Ft Richardson Groundwater
Matrix: Water (Surface, Eff., Ground)

All Dates/Times are Alaska Local Time
Collection Date/Time: 10/18/05 18:15
Receipt Date/Time: 10/20/05 11:53
Location: AP-3534

Dissolved Metals

<u>Parameter</u>	<u>Result</u>	<u>PQL/CL</u>	<u>MDL</u>	<u>Units</u>	<u>DF</u>	<u>Analytical</u> <u>Batch</u>	<u>Prep</u> <u>Batch</u>	<u>Qualifiers</u>
Aluminum	ND	100	31.0	ug/L	5	MMS3863	MXX16524	
Arsenic	ND	10.0	3.10	ug/L	5	MMS3863	MXX16524	
Iron	ND	1000	310	ug/L	5	MMS3863	MXX16524	
Manganese	ND	2.00	0.620	ug/L	5	MMS3863	MXX16524	

Batch Information

Analytical Batch: MMS3863
Analytical Method: SW6020 Diss.
Analysis Date/Time: 10/31/05 14:22
Dilution Factor: 5

Prep Batch: MXX16524
Prep Method: FILTER
Prep Date/Time: 10/18/05 18:15

Initial Prep Wt./Vol.: 100 mL
Prep Extract Vol.: 100 mL
Container ID: 1057045005-I
Analyst: TK



Satori Group, Inc.

Print Date: 11/15/2005

Client Sample ID: **0510FROAWA-05**
SGS Ref. #: 1057045005
Project ID: Ft Richardson Groundwater
Matrix: Water (Surface, Eff., Ground)

All Dates/Times are Alaska Local Time
Collection Date/Time: 10/18/05 18:15
Receipt Date/Time: 10/20/05 11:53
Location: AP-3534

Waters Department

<u>Parameter</u>	<u>Result</u>	<u>PQL/CL</u>	<u>MDL</u>	<u>Units</u>	<u>DF</u>	<u>Analytical Batch</u>	<u>Prep Batch</u>	<u>Qualifiers</u>
Sulfate	23.3	0.100	0.0310	mg/L	1	WIC3768		
Total Nitrate/Nitrite-N	2.37	0.100	0.0310	mg/L	5	WFI1073		

Batch Information

Analytical Batch: WFI1073	Initial Prep Wt./Vol.: 100 mL
Analytical Method: EPA 353.2	
Analysis Date/Time: 10/20/05 17:04	Container ID:1057045005-G
Dilution Factor: 5	Analyst: AZS
<hr/>	
Analytical Batch: WIC3768	Initial Prep Wt./Vol.: 5 mL
Analytical Method: EPA 300.0	
Analysis Date/Time: 10/21/05 12:28	Container ID:1057045005-H
Dilution Factor: 1	Analyst: JEM



Satori Group, Inc.

Print Date: 11/15/2005

Client Sample ID: **0510FROAWA-05**
SGS Ref. #: 1057045005
Project ID: Ft Richardson Groundwater
Matrix: Water (Surface, Eff., Ground)

All Dates/Times are Alaska Local Time
Collection Date/Time: 10/18/05 18:15
Receipt Date/Time: 10/20/05 11:53
Location: AP-3534

Light Gases

<u>Parameter</u>	<u>Result</u>	<u>PQL/CL</u>	<u>MDL</u>	<u>Units</u>	<u>DF</u>	<u>Analytical Batch</u>	<u>Prep Batch</u>	<u>Qualifiers</u>
Methane	ND	5.00	1.50	ug/L	1	GAS1262		

Batch Information

Analytical Batch: GAS1262
Analytical Method: RSK-175
Analysis Date/Time: 10/27/05 13:48
Dilution Factor: 1

Initial Prep Wt./Vol.: 1 mL
Container ID:1057045005-D
Analyst: KWM



Satori Group, Inc.

Print Date: 11/15/2005

Client Sample ID: 0510FROAWA-05
 SGS Ref. #: 1057045005
 Project ID: Ft Richardson Groundwater
 Matrix: Water (Surface, Eff., Ground)

All Dates/Times are Alaska Local Time
 Collection Date/Time: 10/18/05 18:15
 Receipt Date/Time: 10/20/05 11:53
 Location: AP-3534

Volatile Gas Chromatography/Mass Spectroscopy

<u>Parameter</u>	<u>Result</u>	<u>PQL/CL</u>	<u>MDL</u>	<u>Units</u>	<u>DF</u>	<u>Analytical Batch</u>	<u>Prep Batch</u>	<u>Qualifiers</u>
Dichlorodifluoromethane	ND	1.00	0.310	ug/L	1	VMS7993	VXX14625	
Chloromethane	ND	1.00	0.310	ug/L	1	VMS7993	VXX14625	
Vinyl chloride	ND	1.00	0.310	ug/L	1	VMS7993	VXX14625	
Bromomethane	ND	3.00	0.940	ug/L	1	VMS7993	VXX14625	
Chloroethane	ND	1.00	0.310	ug/L	1	VMS7993	VXX14625	
Trichlorofluoromethane	ND	1.00	0.310	ug/L	1	VMS7993	VXX14625	
1,1-Dichloroethene	ND	1.00	0.310	ug/L	1	VMS7993	VXX14625	
Methylene chloride	ND	5.00	1.00	ug/L	1	VMS7993	VXX14625	
Carbon disulfide	ND	2.00	0.620	ug/L	1	VMS7993	VXX14625	
Acetone	ND	10.0	3.10	ug/L	1	VMS7993	VXX14625	
trans-1,2-Dichloroethene	ND	1.00	0.310	ug/L	1	VMS7993	VXX14625	
1,1-Dichloroethane	ND	1.00	0.310	ug/L	1	VMS7993	VXX14625	
2,2-Dichloropropane	ND	1.00	0.310	ug/L	1	VMS7993	VXX14625	
cis-1,2-Dichloroethene	ND	1.00	0.310	ug/L	1	VMS7993	VXX14625	
2-Butanone (MEK)	ND	10.0	3.10	ug/L	1	VMS7993	VXX14625	
Bromochloromethane	ND	1.00	0.310	ug/L	1	VMS7993	VXX14625	
Chloroform	ND	1.00	0.300	ug/L	1	VMS7993	VXX14625	
1,1,1-Trichloroethane	ND	1.00	0.310	ug/L	1	VMS7993	VXX14625	
Carbon tetrachloride	ND	1.00	0.310	ug/L	1	VMS7993	VXX14625	
1,1-Dichloropropene	ND	1.00	0.310	ug/L	1	VMS7993	VXX14625	
Benzene	ND	0.400	0.120	ug/L	1	VMS7993	VXX14625	
Trichloroethene	ND	1.00	0.310	ug/L	1	VMS7993	VXX14625	
1,2-Dichloropropane	ND	1.00	0.310	ug/L	1	VMS7993	VXX14625	
Dibromomethane	ND	1.00	0.310	ug/L	1	VMS7993	VXX14625	
Bromodichloromethane	ND	0.500	0.150	ug/L	1	VMS7993	VXX14625	
2-Chloroethyl Vinyl Ether	ND	10.0	3.10	ug/L	1	VMS7993	VXX14625	
cis-1,3-Dichloropropene	ND	0.500	0.150	ug/L	1	VMS7993	VXX14625	
Toluene	ND	1.00	0.310	ug/L	1	VMS7993	VXX14625	
trans-1,3-Dichloropropene	ND	1.00	0.310	ug/L	1	VMS7993	VXX14625	
1,1,2-Trichloroethane	ND	1.00	0.310	ug/L	1	VMS7993	VXX14625	
Tetrachloroethene	59.1	1.00	0.310	ug/L	1	VMS7993	VXX14625	
1,3-Dichloropropane	ND	0.400	0.120	ug/L	1	VMS7993	VXX14625	
Dibromochloromethane	ND	0.500	0.150	ug/L	1	VMS7993	VXX14625	
1,2-Dibromoethane	ND	1.00	0.310	ug/L	1	VMS7993	VXX14625	
Chlorobenzene	ND	0.500	0.150	ug/L	1	VMS7993	VXX14625	
1,1,1,2-Tetrachloroethane	ND	0.500	0.150	ug/L	1	VMS7993	VXX14625	
Ethylbenzene	ND	1.00	0.310	ug/L	1	VMS7993	VXX14625	



Satori Group, Inc.

Print Date: 11/15/2005

Client Sample ID: 0510FROAWA-05
SGS Ref. #: 1057045005
Project ID: Ft Richardson Groundwater
Matrix: Water (Surface, Eff., Ground)

All Dates/Times are Alaska Local Time
Collection Date/Time: 10/18/05 18:15
Receipt Date/Time: 10/20/05 11:53
Location: AP-3534

Volatile Gas Chromatography/Mass Spectroscopy

<u>Parameter</u>	<u>Result</u>	<u>PQL/CL</u>	<u>MDL</u>	<u>Units</u>	<u>DF</u>	<u>Analytical</u> <u>Batch</u>	<u>Prep</u> <u>Batch</u>	<u>Qualifiers</u>
P & M -Xylene	ND	2.00	0.620	ug/L	1	VMS7993	VXX14625	
Styrene	ND	1.00	0.310	ug/L	1	VMS7993	VXX14625	
Bromoform	ND	1.00	0.310	ug/L	1	VMS7993	VXX14625	
Isopropylbenzene (Cumene)	ND	1.00	0.310	ug/L	1	VMS7993	VXX14625	
Bromobenzene	ND	1.00	0.310	ug/L	1	VMS7993	VXX14625	
o-Xylene	ND	1.00	0.310	ug/L	1	VMS7993	VXX14625	
1,1,2,2-Tetrachloroethane	ND	0.500	0.150	ug/L	1	VMS7993	VXX14625	
1,2,3-Trichloropropane	ND	1.00	0.310	ug/L	1	VMS7993	VXX14625	
n-Propylbenzene	ND	1.00	0.310	ug/L	1	VMS7993	VXX14625	
2-Chlorotoluene	ND	1.00	0.310	ug/L	1	VMS7993	VXX14625	
4-Chlorotoluene	ND	1.00	0.310	ug/L	1	VMS7993	VXX14625	
1,3,5-Trimethylbenzene	ND	1.00	0.310	ug/L	1	VMS7993	VXX14625	
tert-Butylbenzene	ND	1.00	0.310	ug/L	1	VMS7993	VXX14625	
1,2,4-Trimethylbenzene	ND	1.00	0.310	ug/L	1	VMS7993	VXX14625	
sec-Butylbenzene	ND	1.00	0.310	ug/L	1	VMS7993	VXX14625	
4-Isopropyltoluene	ND	1.00	0.310	ug/L	1	VMS7993	VXX14625	
1,4-Dichlorobenzene	ND	0.500	0.150	ug/L	1	VMS7993	VXX14625	
1,2-Dichlorobenzene	ND	1.00	0.310	ug/L	1	VMS7993	VXX14625	
1,3-Dichlorobenzene	ND	1.00	0.310	ug/L	1	VMS7993	VXX14625	
n-Butylbenzene	ND	1.00	0.310	ug/L	1	VMS7993	VXX14625	
1,2-Dibromo-3-chloropropane	ND	2.00	0.620	ug/L	1	VMS7993	VXX14625	
1,2,4-Trichlorobenzene	ND	1.00	0.310	ug/L	1	VMS7993	VXX14625	
Hexachlorobutadiene	ND	1.00	0.310	ug/L	1	VMS7993	VXX14625	
Naphthalene	ND	2.00	0.620	ug/L	1	VMS7993	VXX14625	
1,2,3-Trichlorobenzene	ND	1.00	0.310	ug/L	1	VMS7993	VXX14625	
4-Methyl-2-pentanone (MIBK)	ND	10.0	3.10	ug/L	1	VMS7993	VXX14625	
2-Hexanone	ND	10.0	3.10	ug/L	1	VMS7993	VXX14625	
Methyl-t-butyl ether	ND	5.00	1.50	ug/L	1	VMS7993	VXX14625	
1,2-Dichloroethane	ND	0.500	0.150	ug/L	1	VMS7993	VXX14625	
Dibromofluoromethane <surr>	99.2	85-115		%	1	VMS7993	VXX14625	
1,2-Dichloroethane-D4 <surr>	102	72-119		%	1	VMS7993	VXX14625	
Toluene-d8 <surr>	103	85-120		%	1	VMS7993	VXX14625	
4-Bromofluorobenzene <surr>	112	76-119		%	1	VMS7993	VXX14625	



Satori Group, Inc.

Print Date: 11/15/2005

Client Sample ID: 0510FROAWA-05
SGS Ref. #: 1057045005
Project ID: Ft Richardson Groundwater
Matrix: Water (Surface, Eff., Ground)

All Dates/Times are Alaska Local Time
Collection Date/Time: 10/18/05 18:15
Receipt Date/Time: 10/20/05 11:53
Location: AP-3534

Volatile Gas Chromatography/Mass Spectroscopy

<u>Parameter</u>	<u>Result</u>	<u>PQL/CL</u>	<u>MDL</u>	<u>Units</u>	<u>DF</u>	<u>Analytical</u> <u>Batch</u>	<u>Prep</u> <u>Batch</u>	<u>Qualifiers</u>
Batch Information								
Analytical Batch: VMS7993			Prep Batch: VXX14625				Initial Prep Wt./Vol.: 5 mL	
Analytical Method: SW8260B			Prep Method: SW5030B				Prep Extract Vol.: 5 mL	
Analysis Date/Time: 10/29/05 00:09			Prep Date/Time: 10/28/05 10:00				Container ID:1057045005-A	
Dilution Factor: 1							Analyst: VS	



Satori Group, Inc.

Print Date: 11/15/2005

Client Sample ID: 0510FROAWA-06
SGS Ref. #: 1057045006
Project ID: Ft Richardson Groundwater
Matrix: Water (Surface, Eff., Ground)

All Dates/Times are Alaska Local Time
Collection Date/Time: 10/19/05 11:55
Receipt Date/Time: 10/20/05 11:53
Location: AP-3870

Dissolved Metals

<u>Parameter</u>	<u>Result</u>	<u>PQL/CL</u>	<u>MDL</u>	<u>Units</u>	<u>DF</u>	<u>Analytical Batch</u>	<u>Prep Batch</u>	<u>Qualifiers</u>
Aluminum	ND	100	31.0	ug/L	5	MMS3863	MXX16524	
Arsenic	ND	10.0	3.10	ug/L	5	MMS3863	MXX16524	
Iron	ND	1000	310	ug/L	5	MMS3863	MXX16524	
Manganese	ND	2.00	0.620	ug/L	5	MMS3863	MXX16524	

Batch Information

Analytical Batch: MMS3863
Analytical Method: SW6020 Diss.
Analysis Date/Time: 10/31/05 13:02
Dilution Factor: 5

Prep Batch: MXX16524
Prep Method: FILTER
Prep Date/Time: 10/19/05 11:55

Initial Prep Wt./Vol.: 100 mL
Prep Extract Vol.: 100 mL
Container ID:1057045006-I
Analyst: TK



Satori Group, Inc.

Print Date: 11/15/2005

Client Sample ID: **0510FROAWA-06**
SGS Ref. #: 1057045006
Project ID: Ft Richardson Groundwater
Matrix: Water (Surface, Eff., Ground)

All Dates/Times are Alaska Local Time
Collection Date/Time: 10/19/05 11:55
Receipt Date/Time: 10/20/05 11:53
Location: AP-3870

Waters Department

<u>Parameter</u>	<u>Result</u>	<u>PQL/CL</u>	<u>MDL</u>	<u>Units</u>	<u>DF</u>	<u>Analytical Batch</u>	<u>Prep Batch</u>	<u>Qualifiers</u>
Total Nitrate/Nitrite-N	2.01	0.100	0.0310	mg/L	5	WFI1073		
Sulfate	23.1	0.100	0.0310	mg/L	1	WIC3768		

Batch Information

Analytical Batch: WFI1073 Initial Prep Wt./Vol.: 100 mL
Analytical Method: EPA 353.2
Analysis Date/Time: 10/20/05 17:13 Container ID:1057045006-G
Dilution Factor: 5 Analyst: AZS

Analytical Batch: WIC3768 Initial Prep Wt./Vol.: 5 mL
Analytical Method: EPA 300.0
Analysis Date/Time: 10/21/05 10:21 Container ID:1057045006-H
Dilution Factor: 1 Analyst: JEM



Satori Group, Inc.

Print Date: 11/15/2005

Client Sample ID: **0510FROAWA-06**
SGS Ref. #: 1057045006
Project ID: Ft Richardson Groundwater
Matrix: Water (Surface, Eff., Ground)

All Dates/Times are Alaska Local Time
Collection Date/Time: 10/19/05 11:55
Receipt Date/Time: 10/20/05 11:53
Location: AP-3870

Light Gases

<u>Parameter</u>	<u>Result</u>	<u>PQL/CL</u>	<u>MDL</u>	<u>Units</u>	<u>DF</u>	<u>Analytical Batch</u>	<u>Prep Batch</u>	<u>Qualifiers</u>
Methane	ND	5.00	1.50	ug/L	1	GAS1263		

Batch Information

Analytical Batch: GAS1263
Analytical Method: RSK-175
Analysis Date/Time: 10/28/05 10:48
Dilution Factor: 1

Initial Prep Wt./Vol.: 1 mL
Container ID:1057045006-D
Analyst: KWM



Satori Group, Inc.

Print Date: 11/15/2005

Client Sample ID: 0510FROAWA-06
SGS Ref. #: 1057045006
Project ID: Ft Richardson Groundwater
Matrix: Water (Surface, Eff., Ground)

All Dates/Times are Alaska Local Time
Collection Date/Time: 10/19/05 11:55
Receipt Date/Time: 10/20/05 11:53
Location: AP-3870

Volatile Gas Chromatography/Mass Spectroscopy

<u>Parameter</u>	<u>Result</u>	<u>PQL/CL</u>	<u>MDL</u>	<u>Units</u>	<u>DF</u>	<u>Analytical</u> <u>Batch</u>	<u>Prep</u> <u>Batch</u>	<u>Qualifiers</u>
Dichlorodifluoromethane	ND	1.00	0.310	ug/L	1	VMS7993	VXX14625	
Chloromethane	ND	1.00	0.310	ug/L	1	VMS7993	VXX14625	
Vinyl chloride	ND	1.00	0.310	ug/L	1	VMS7993	VXX14625	
Bromomethane	ND	3.00	0.940	ug/L	1	VMS7993	VXX14625	
Chloroethane	ND	1.00	0.310	ug/L	1	VMS7993	VXX14625	
1,1-Dichloroethene	ND	1.00	0.310	ug/L	1	VMS7993	VXX14625	
Trichlorofluoromethane	ND	1.00	0.310	ug/L	1	VMS7993	VXX14625	
Methylene chloride	ND	5.00	1.00	ug/L	1	VMS7993	VXX14625	
Carbon disulfide	ND	2.00	0.620	ug/L	1	VMS7993	VXX14625	
Acetone	ND	10.0	3.10	ug/L	1	VMS7993	VXX14625	
trans-1,2-Dichloroethene	ND	1.00	0.310	ug/L	1	VMS7993	VXX14625	
1,1-Dichloroethane	ND	1.00	0.310	ug/L	1	VMS7993	VXX14625	
2,2-Dichloropropane	ND	1.00	0.310	ug/L	1	VMS7993	VXX14625	
cis-1,2-Dichloroethene	ND	1.00	0.310	ug/L	1	VMS7993	VXX14625	
2-Butanone (MEK)	ND	10.0	3.10	ug/L	1	VMS7993	VXX14625	
Bromochloromethane	ND	1.00	0.310	ug/L	1	VMS7993	VXX14625	
Chloroform	0.350 J	1.00	0.300	ug/L	1	VMS7993	VXX14625	
1,1,1-Trichloroethane	ND	1.00	0.310	ug/L	1	VMS7993	VXX14625	
Carbon tetrachloride	ND	1.00	0.310	ug/L	1	VMS7993	VXX14625	
1,1-Dichloropropene	ND	1.00	0.310	ug/L	1	VMS7993	VXX14625	
Benzene	ND	0.400	0.120	ug/L	1	VMS7993	VXX14625	
Trichloroethene	ND	1.00	0.310	ug/L	1	VMS7993	VXX14625	
1,2-Dichloropropane	ND	1.00	0.310	ug/L	1	VMS7993	VXX14625	
Dibromomethane	ND	1.00	0.310	ug/L	1	VMS7993	VXX14625	
Bromodichloromethane	ND	0.500	0.150	ug/L	1	VMS7993	VXX14625	
2-Chloroethyl Vinyl Ether	ND	10.0	3.10	ug/L	1	VMS7993	VXX14625	
cis-1,3-Dichloropropene	ND	0.500	0.150	ug/L	1	VMS7993	VXX14625	
Toluene	ND	1.00	0.310	ug/L	1	VMS7993	VXX14625	
trans-1,3-Dichloropropene	ND	1.00	0.310	ug/L	1	VMS7993	VXX14625	
1,1,2-Trichloroethane	ND	1.00	0.310	ug/L	1	VMS7993	VXX14625	
Tetrachloroethene	ND	1.00	0.310	ug/L	1	VMS7993	VXX14625	
1,3-Dichloropropane	ND	0.400	0.120	ug/L	1	VMS7993	VXX14625	
Dibromochloromethane	ND	0.500	0.150	ug/L	1	VMS7993	VXX14625	
1,2-Dibromoethane	ND	1.00	0.310	ug/L	1	VMS7993	VXX14625	
Chlorobenzene	ND	0.500	0.150	ug/L	1	VMS7993	VXX14625	
1,1,1,2-Tetrachloroethane	ND	0.500	0.150	ug/L	1	VMS7993	VXX14625	
Ethylbenzene	ND	1.00	0.310	ug/L	1	VMS7993	VXX14625	



Satori Group, Inc.

Print Date: 11/15/2005

Client Sample ID: 0510FROAWA-06
SGS Ref. #: 1057045006
Project ID: Ft Richardson Groundwater
Matrix: Water (Surface, Eff., Ground)

All Dates/Times are Alaska Local Time
Collection Date/Time: 10/19/05 11:55
Receipt Date/Time: 10/20/05 11:53
Location: AP-3870

Volatile Gas Chromatography/Mass Spectroscopy

<u>Parameter</u>	<u>Result</u>	<u>PQL/CL</u>	<u>MDL</u>	<u>Units</u>	<u>DF</u>	<u>Analytical</u> <u>Batch</u>	<u>Prep</u> <u>Batch</u>	<u>Qualifiers</u>
P & M -Xylene	ND	2.00	0.620	ug/L	1	VMS7993	VXX14625	
Styrene	ND	1.00	0.310	ug/L	1	VMS7993	VXX14625	
Bromoform	ND	1.00	0.310	ug/L	1	VMS7993	VXX14625	
Isopropylbenzene (Cumene)	ND	1.00	0.310	ug/L	1	VMS7993	VXX14625	
o-Xylene	ND	1.00	0.310	ug/L	1	VMS7993	VXX14625	
Bromobenzene	ND	1.00	0.310	ug/L	1	VMS7993	VXX14625	
1,1,2,2-Tetrachloroethane	ND	0.500	0.150	ug/L	1	VMS7993	VXX14625	
1,2,3-Trichloropropane	ND	1.00	0.310	ug/L	1	VMS7993	VXX14625	
n-Propylbenzene	ND	1.00	0.310	ug/L	1	VMS7993	VXX14625	
2-Chlorotoluene	ND	1.00	0.310	ug/L	1	VMS7993	VXX14625	
4-Chlorotoluene	ND	1.00	0.310	ug/L	1	VMS7993	VXX14625	
1,3,5-Trimethylbenzene	ND	1.00	0.310	ug/L	1	VMS7993	VXX14625	
tert-Butylbenzene	ND	1.00	0.310	ug/L	1	VMS7993	VXX14625	
1,2,4-Trimethylbenzene	ND	1.00	0.310	ug/L	1	VMS7993	VXX14625	
sec-Butylbenzene	ND	1.00	0.310	ug/L	1	VMS7993	VXX14625	
4-Isopropyltoluene	ND	1.00	0.310	ug/L	1	VMS7993	VXX14625	
1,4-Dichlorobenzene	ND	0.500	0.150	ug/L	1	VMS7993	VXX14625	
1,2-Dichlorobenzene	ND	1.00	0.310	ug/L	1	VMS7993	VXX14625	
1,3-Dichlorobenzene	ND	1.00	0.310	ug/L	1	VMS7993	VXX14625	
n-Butylbenzene	ND	1.00	0.310	ug/L	1	VMS7993	VXX14625	
1,2-Dibromo-3-chloropropane	ND	2.00	0.620	ug/L	1	VMS7993	VXX14625	
1,2,4-Trichlorobenzene	ND	1.00	0.310	ug/L	1	VMS7993	VXX14625	
Hexachlorobutadiene	ND	1.00	0.310	ug/L	1	VMS7993	VXX14625	
Naphthalene	ND	2.00	0.620	ug/L	1	VMS7993	VXX14625	
1,2,3-Trichlorobenzene	ND	1.00	0.310	ug/L	1	VMS7993	VXX14625	
4-Methyl-2-pentanone (MIBK)	ND	10.0	3.10	ug/L	1	VMS7993	VXX14625	
2-Hexanone	ND	10.0	3.10	ug/L	1	VMS7993	VXX14625	
Methyl-t-butyl ether	ND	5.00	1.50	ug/L	1	VMS7993	VXX14625	
1,2-Dichloroethane	ND	0.500	0.150	ug/L	1	VMS7993	VXX14625	
Dibromofluoromethane <surr>	104	85-115		%	1	VMS7993	VXX14625	
1,2-Dichloroethane-D4 <surr>	104	72-119		%	1	VMS7993	VXX14625	
Toluene-d8 <surr>	101	85-120		%	1	VMS7993	VXX14625	
4-Bromofluorobenzene <surr>	107	76-119		%	1	VMS7993	VXX14625	



Satori Group, Inc.

Print Date: 11/15/2005

Client Sample ID: **0510FROAWA-06**
SGS Ref. #: 1057045006
Project ID: Ft Richardson Groundwater
Matrix: Water (Surface, Eff., Ground)

All Dates/Times are Alaska Local Time
Collection Date/Time: 10/19/05 11:55
Receipt Date/Time: 10/20/05 11:53
Location: AP-3870

Volatile Gas Chromatography/Mass Spectroscopy

<u>Parameter</u>	<u>Result</u>	<u>PQL/CL</u>	<u>MDL</u>	<u>Units</u>	<u>DF</u>	<u>Analytical</u> <u>Batch</u>	<u>Prep</u> <u>Batch</u>	<u>Qualifiers</u>
Batch Information								
Analytical Batch: VMS7993			Prep Batch: VXX14625				Initial Prep Wt./Vol.: 5 mL	
Analytical Method: SW8260B			Prep Method: SW5030B				Prep Extract Vol.: 5 mL	
Analysis Date/Time: 10/28/05 22:21			Prep Date/Time: 10/28/05 10:00				Container ID:1057045006-A	
Dilution Factor: 1							Analyst: VS	



Satori Group, Inc.

Print Date: 11/15/2005

Client Sample ID: 0510FROAWA-07
SGS Ref. #: 1057045010
Project ID: Ft Richardson Groundwater
Matrix: Water (Surface, Eff., Ground)

All Dates/Times are Alaska Local Time
Collection Date/Time: 10/19/05 11:25
Receipt Date/Time: 10/20/05 11:53
Location: AP-3888

Dissolved Metals

<u>Parameter</u>	<u>Result</u>	<u>PQL/CL</u>	<u>MDL</u>	<u>Units</u>	<u>DF</u>	<u>Analytical Batch</u>	<u>Prep Batch</u>	<u>Qualifiers</u>
Aluminum	ND	100	31.0	ug/L	5	MMS3863	MXX16524	
Arsenic	ND	10.0	3.10	ug/L	5	MMS3863	MXX16524	
Iron	ND	1000	310	ug/L	5	MMS3863	MXX16524	
Manganese	ND	2.00	0.620	ug/L	5	MMS3863	MXX16524	

Batch Information

Analytical Batch: MMS3863
Analytical Method: SW6020 Diss.
Analysis Date/Time: 10/31/05 13:19
Dilution Factor: 5

Prep Batch: MXX16524
Prep Method: FILTER
Prep Date/Time: 10/19/05 11:25

Initial Prep Wt./Vol.: 100 mL
Prep Extract Vol.: 100 mL
Container ID:1057045010-I
Analyst: TK



Satori Group, Inc.

Print Date: 11/15/2005

Client Sample ID: 0510FROAWA-07
SGS Ref. #: 1057045010
Project ID: Ft Richardson Groundwater
Matrix: Water (Surface, Eff., Ground)

All Dates/Times are Alaska Local Time
Collection Date/Time: 10/19/05 11:25
Receipt Date/Time: 10/20/05 11:53
Location: AP-3888

Waters Department

<u>Parameter</u>	<u>Result</u>	<u>PQL/CL</u>	<u>MDL</u>	<u>Units</u>	<u>DF</u>	<u>Analytical Batch</u>	<u>Prep Batch</u>	<u>Qualifiers</u>
Total Nitrate/Nitrite-N Sulfate	2.01	0.100	0.0310	mg/L	5	WF11073		
	23.7	0.100	0.0310	mg/L	1	WIC3768		

Batch Information

Analytical Batch: WF11073 Initial Prep Wt./Vol.: 100 mL
Analytical Method: EPA 353.2
Analysis Date/Time: 10/20/05 17:05 Container ID:1057045010-G
Dilution Factor: 5 Analyst: AZS

Analytical Batch: WIC3768 Initial Prep Wt./Vol.: 5 mL
Analytical Method: EPA 300.0
Analysis Date/Time: 10/21/05 13:23 Container ID:1057045010-H
Dilution Factor: 1 Analyst: JEM



Satori Group, Inc.

Print Date: 11/15/2005

Client Sample ID: 0510FROAWA-07
SGS Ref. #: 1057045010
Project ID: Ft Richardson Groundwater
Matrix: Water (Surface, Eff., Ground)

All Dates/Times are Alaska Local Time
Collection Date/Time: 10/19/05 11:25
Receipt Date/Time: 10/20/05 11:53
Location: AP-3888

Light Gases

<u>Parameter</u>	<u>Result</u>	<u>PQL/CL</u>	<u>MDL</u>	<u>Units</u>	<u>DF</u>	<u>Analytical Batch</u>	<u>Prep Batch</u>	<u>Qualifiers</u>
Methane	ND	5.00	1.50	ug/L	1	GAS1263		

Batch Information

Analytical Batch: GAS1263
Analytical Method: RSK-175
Analysis Date/Time: 10/28/05 11:07
Dilution Factor: 1

Initial Prep Wt./Vol.: 1 mL
Container ID: 1057045010-D
Analyst: KWM



Satori Group, Inc.

Print Date: 11/15/2005

Client Sample ID: 0510FROAWA-07
 SGS Ref. #: 1057045010
 Project ID: Ft Richardson Groundwater
 Matrix: Water (Surface, Eff., Ground)

All Dates/Times are Alaska Local Time
 Collection Date/Time: 10/19/05 11:25
 Receipt Date/Time: 10/20/05 11:53
 Location: AP-3888

Volatile Gas Chromatography/Mass Spectroscopy

<u>Parameter</u>	<u>Result</u>	<u>PQL/CL</u>	<u>MDL</u>	<u>Units</u>	<u>DF</u>	<u>Analytical Batch</u>	<u>Prep Batch</u>	<u>Qualifiers</u>
Dichlorodifluoromethane	ND	1.00	0.310	ug/L	1	VMS7993	VXX14625	
Chloromethane	ND	1.00	0.310	ug/L	1	VMS7993	VXX14625	
Vinyl chloride	ND	1.00	0.310	ug/L	1	VMS7993	VXX14625	
Bromomethane	ND	3.00	0.940	ug/L	1	VMS7993	VXX14625	
Chloroethane	ND	1.00	0.310	ug/L	1	VMS7993	VXX14625	
Trichlorofluoromethane	ND	1.00	0.310	ug/L	1	VMS7993	VXX14625	
1,1-Dichloroethene	ND	1.00	0.310	ug/L	1	VMS7993	VXX14625	
Methylene chloride	ND	5.00	1.00	ug/L	1	VMS7993	VXX14625	
Carbon disulfide	1.13 J	2.00	0.620	ug/L	1	VMS7993	VXX14625	
Acetone	ND	10.0	3.10	ug/L	1	VMS7993	VXX14625	
trans-1,2-Dichloroethene	ND	1.00	0.310	ug/L	1	VMS7993	VXX14625	
1,1-Dichloroethane	ND	1.00	0.310	ug/L	1	VMS7993	VXX14625	
2,2-Dichloropropane	ND	1.00	0.310	ug/L	1	VMS7993	VXX14625	
cis-1,2-Dichloroethene	ND	1.00	0.310	ug/L	1	VMS7993	VXX14625	
Bromochloromethane	ND	1.00	0.310	ug/L	1	VMS7993	VXX14625	
2-Butanone (MEK)	ND	10.0	3.10	ug/L	1	VMS7993	VXX14625	
Chloroform	0.370 J	1.00	0.300	ug/L	1	VMS7993	VXX14625	
1,1,1-Trichloroethane	ND	1.00	0.310	ug/L	1	VMS7993	VXX14625	
Carbon tetrachloride	ND	1.00	0.310	ug/L	1	VMS7993	VXX14625	
1,1-Dichloropropene	ND	1.00	0.310	ug/L	1	VMS7993	VXX14625	
Benzene	ND	0.400	0.120	ug/L	1	VMS7993	VXX14625	
Trichloroethene	ND	1.00	0.310	ug/L	1	VMS7993	VXX14625	
1,2-Dichloropropane	ND	1.00	0.310	ug/L	1	VMS7993	VXX14625	
Dibromomethane	ND	1.00	0.310	ug/L	1	VMS7993	VXX14625	
Bromodichloromethane	ND	0.500	0.150	ug/L	1	VMS7993	VXX14625	
2-Chloroethyl Vinyl Ether	ND	10.0	3.10	ug/L	1	VMS7993	VXX14625	
cis-1,3-Dichloropropene	ND	0.500	0.150	ug/L	1	VMS7993	VXX14625	
Toluene	ND	1.00	0.310	ug/L	1	VMS7993	VXX14625	
trans-1,3-Dichloropropene	ND	1.00	0.310	ug/L	1	VMS7993	VXX14625	
1,1,2-Trichloroethane	ND	1.00	0.310	ug/L	1	VMS7993	VXX14625	
Tetrachloroethene	ND	1.00	0.310	ug/L	1	VMS7993	VXX14625	
1,3-Dichloropropane	ND	0.400	0.120	ug/L	1	VMS7993	VXX14625	
Dibromochloromethane	ND	0.500	0.150	ug/L	1	VMS7993	VXX14625	
1,2-Dibromoethane	ND	1.00	0.310	ug/L	1	VMS7993	VXX14625	
Chlorobenzene	ND	0.500	0.150	ug/L	1	VMS7993	VXX14625	
1,1,1,2-Tetrachloroethane	ND	0.500	0.150	ug/L	1	VMS7993	VXX14625	
Ethylbenzene	ND	1.00	0.310	ug/L	1	VMS7993	VXX14625	



Satori Group, Inc.

Print Date: 11/15/2005

Client Sample ID: **0510FROAWA-07**
SGS Ref. #: 1057045010
Project ID: Ft Richardson Groundwater
Matrix: Water (Surface, Eff., Ground)

All Dates/Times are Alaska Local Time
Collection Date/Time: 10/19/05 11:25
Receipt Date/Time: 10/20/05 11:53
Location: AP-3888

Volatile Gas Chromatography/Mass Spectroscopy

<u>Parameter</u>	<u>Result</u>	<u>PQL/CL</u>	<u>MDL</u>	<u>Units</u>	<u>DF</u>	<u>Analytical</u> <u>Batch</u>	<u>Prep</u> <u>Batch</u>	<u>Qualifiers</u>
P & M -Xylene	ND	2.00	0.620	ug/L	1	VMS7993	VXX14625	
Styrene	ND	1.00	0.310	ug/L	1	VMS7993	VXX14625	
Bromoform	ND	1.00	0.310	ug/L	1	VMS7993	VXX14625	
Isopropylbenzene (Cumene)	ND	1.00	0.310	ug/L	1	VMS7993	VXX14625	
Bromobenzene	ND	1.00	0.310	ug/L	1	VMS7993	VXX14625	
o-Xylene	ND	1.00	0.310	ug/L	1	VMS7993	VXX14625	
1,1,2,2-Tetrachloroethane	ND	0.500	0.150	ug/L	1	VMS7993	VXX14625	
1,2,3-Trichloropropane	ND	1.00	0.310	ug/L	1	VMS7993	VXX14625	
n-Propylbenzene	ND	1.00	0.310	ug/L	1	VMS7993	VXX14625	
2-Chlorotoluene	ND	1.00	0.310	ug/L	1	VMS7993	VXX14625	
4-Chlorotoluene	ND	1.00	0.310	ug/L	1	VMS7993	VXX14625	
1,3,5-Trimethylbenzene	ND	1.00	0.310	ug/L	1	VMS7993	VXX14625	
tert-Butylbenzene	ND	1.00	0.310	ug/L	1	VMS7993	VXX14625	
1,2,4-Trimethylbenzene	ND	1.00	0.310	ug/L	1	VMS7993	VXX14625	
sec-Butylbenzene	ND	1.00	0.310	ug/L	1	VMS7993	VXX14625	
4-Isopropyltoluene	ND	1.00	0.310	ug/L	1	VMS7993	VXX14625	
1,4-Dichlorobenzene	ND	0.500	0.150	ug/L	1	VMS7993	VXX14625	
1,2-Dichlorobenzene	ND	1.00	0.310	ug/L	1	VMS7993	VXX14625	
n-Butylbenzene	ND	1.00	0.310	ug/L	1	VMS7993	VXX14625	
1,3-Dichlorobenzene	ND	1.00	0.310	ug/L	1	VMS7993	VXX14625	
1,2-Dibromo-3-chloropropane	ND	2.00	0.620	ug/L	1	VMS7993	VXX14625	
1,2,4-Trichlorobenzene	ND	1.00	0.310	ug/L	1	VMS7993	VXX14625	
Hexachlorobutadiene	ND	1.00	0.310	ug/L	1	VMS7993	VXX14625	
Naphthalene	ND	2.00	0.620	ug/L	1	VMS7993	VXX14625	
1,2,3-Trichlorobenzene	ND	1.00	0.310	ug/L	1	VMS7993	VXX14625	
4-Methyl-2-pentanone (MIBK)	ND	10.0	3.10	ug/L	1	VMS7993	VXX14625	
2-Hexanone	ND	10.0	3.10	ug/L	1	VMS7993	VXX14625	
Methyl-t-butyl ether	ND	5.00	1.50	ug/L	1	VMS7993	VXX14625	
1,2-Dichloroethane	ND	0.500	0.150	ug/L	1	VMS7993	VXX14625	
Dibromofluoromethane <sur>	96.6	85-115		%	1	VMS7993	VXX14625	
1,2-Dichloroethane-D4 <sur>	98.7	72-119		%	1	VMS7993	VXX14625	
Toluene-d8 <sur>	96.5	85-120		%	1	VMS7993	VXX14625	
4-Bromofluorobenzene <sur>	99.5	76-119		%	1	VMS7993	VXX14625	



Satori Group, Inc.

Print Date: 11/15/2005

Client Sample ID: 0510FROAWA-07
SGS Ref. #: 1057045010
Project ID: Ft Richardson Groundwater
Matrix: Water (Surface, Eff., Ground)

All Dates/Times are Alaska Local Time
Collection Date/Time: 10/19/05 11:25
Receipt Date/Time: 10/20/05 11:53
Location: AP-3888

Volatile Gas Chromatography/Mass Spectroscopy

<u>Parameter</u>	<u>Result</u>	<u>PQL/CL</u>	<u>MDL</u>	<u>Units</u>	<u>DF</u>	<u>Analytical Batch</u>	<u>Prep Batch</u>	<u>Qualifiers</u>
Batch Information								
Analytical Batch: VMS7993			Prep Batch: VXX14625				Initial Prep Wt./Vol.: 5 mL	
Analytical Method: SW8260B			Prep Method: SW5030B				Prep Extract Vol.: 5 mL	
Analysis Date/Time: 10/28/05 22:57			Prep Date/Time: 10/28/05 10:00				Container ID:1057045010-A	
Dilution Factor: 1							Analyst: VS	



Satori Group, Inc.

Print Date: 11/15/2005

Client Sample ID: 0510FROAWA-08
SGS Ref. #: 1057045011
Project ID: Ft Richardson Groundwater
Matrix: Water (Surface, Eff., Ground)

All Dates/Times are Alaska Local Time
Collection Date/Time: 10/19/05 14:40
Receipt Date/Time: 10/20/05 11:53
Location: AP-4411

Dissolved Metals

<u>Parameter</u>	<u>Result</u>	<u>PQL/CL</u>	<u>MDL</u>	<u>Units</u>	<u>DF</u>	<u>Analytical Batch</u>	<u>Prep Batch</u>	<u>Qualifiers</u>
Aluminum	ND	100	31.0	ug/L	5	MMS3863	MXX16524	
Arsenic	ND	10.0	3.10	ug/L	5	MMS3863	MXX16524	
Iron	ND	1000	310	ug/L	5	MMS3863	MXX16524	
Manganese	ND	2.00	0.620	ug/L	5	MMS3863	MXX16524	

Batch Information

Analytical Batch: MMS3863
Analytical Method: SW6020 Diss.
Analysis Date/Time: 10/31/05 13:37
Dilution Factor: 5

Prep Batch: MXX16524
Prep Method: FILTER
Prep Date/Time: 10/19/05 14:40

Initial Prep Wt./Vol.: 100 mL
Prep Extract Vol.: 100 mL
Container ID:1057045011-I
Analyst: TK



Satori Group, Inc.

Print Date: 11/15/2005

Client Sample ID: 0510FROAWA-08
SGS Ref. #: 1057045011
Project ID: Ft Richardson Groundwater
Matrix: Water (Surface, Eff., Ground)

All Dates/Times are Alaska Local Time
Collection Date/Time: 10/19/05 14:40
Receipt Date/Time: 10/20/05 11:53
Location: AP-4411

Waters Department

<u>Parameter</u>	<u>Result</u>	<u>PQL/CL</u>	<u>MDL</u>	<u>Units</u>	<u>DF</u>	<u>Analytical Batch</u>	<u>Prep Batch</u>	<u>Qualifiers</u>
Sulfate	16.4	0.100	0.0310	mg/L	1	WIC3768		
Total Nitrate/Nitrite-N	1.38	0.100	0.0310	mg/L	5	WFI1073		

Batch Information

Analytical Batch: WFI1073
Analytical Method: EPA 353.2
Analysis Date/Time: 10/20/05 17:07
Dilution Factor: 5

Initial Prep Wt./Vol.: 100 mL
Container ID:1057045011-G
Analyst: AZS

Analytical Batch: WIC3768
Analytical Method: EPA 300.0
Analysis Date/Time: 10/21/05 13:41
Dilution Factor: 1

Initial Prep Wt./Vol.: 5 mL
Container ID:1057045011-H
Analyst: JEM



Satori Group, Inc.

Print Date: 11/15/2005

Client Sample ID: 0510FROAWA-08
SGS Ref. #: 1057045011
Project ID: Ft Richardson Groundwater
Matrix: Water (Surface, Eff., Ground)

All Dates/Times are Alaska Local Time
Collection Date/Time: 10/19/05 14:40
Receipt Date/Time: 10/20/05 11:53
Location: AP-4411

Light Gases

<u>Parameter</u>	<u>Result</u>	<u>PQL/CL</u>	<u>MDL</u>	<u>Units</u>	<u>DF</u>	<u>Analytical Batch</u>	<u>Prep Batch</u>	<u>Qualifiers</u>
Methane	ND	5.00	1.50	ug/L	1	GAS1263		

Batch Information

Analytical Batch: GAS1263
Analytical Method: RSK-175
Analysis Date/Time: 10/28/05 11:14
Dilution Factor: 1

Initial Prep Wt./Vol.: 1 mL
Container ID:1057045011-D
Analyst: KWM



Satori Group, Inc.

Print Date: 11/15/2005

Client Sample ID: **0510FROAWA-08**
 SGS Ref. #: 1057045011
 Project ID: Ft Richardson Groundwater
 Matrix: Water (Surface, Eff., Ground)

All Dates/Times are Alaska Local Time
 Collection Date/Time: 10/19/05 14:40
 Receipt Date/Time: 10/20/05 11:53
 Location: AP-4411

Volatile Gas Chromatography/Mass Spectroscopy

<u>Parameter</u>	<u>Result</u>	<u>PQL/CL</u>	<u>MDL</u>	<u>Units</u>	<u>DF</u>	<u>Analytical</u> <u>Batch</u>	<u>Prep</u> <u>Batch</u>	<u>Qualifiers</u>
Dichlorodifluoromethane	ND	1.00	0.310	ug/L	1	VMS7995	VXX14631	
Chloromethane	ND	1.00	0.310	ug/L	1	VMS7995	VXX14631	
Vinyl chloride	ND	1.00	0.310	ug/L	1	VMS7995	VXX14631	
Bromomethane	ND	3.00	0.940	ug/L	1	VMS7995	VXX14631	
Chloroethane	ND	1.00	0.310	ug/L	1	VMS7995	VXX14631	
Trichlorofluoromethane	ND	1.00	0.310	ug/L	1	VMS7995	VXX14631	
1,1-Dichloroethene	ND	1.00	0.310	ug/L	1	VMS7995	VXX14631	
Methylene chloride	ND	5.00	1.00	ug/L	1	VMS7995	VXX14631	
Carbon disulfide	ND	2.00	0.620	ug/L	1	VMS7995	VXX14631	
Acetone	ND	10.0	3.10	ug/L	1	VMS7995	VXX14631	
trans-1,2-Dichloroethene	ND	1.00	0.310	ug/L	1	VMS7995	VXX14631	
1,1-Dichloroethane	ND	1.00	0.310	ug/L	1	VMS7995	VXX14631	
2,2-Dichloropropane	ND	1.00	0.310	ug/L	1	VMS7995	VXX14631	
cis-1,2-Dichloroethene	ND	1.00	0.310	ug/L	1	VMS7995	VXX14631	
2-Butanone (MEK)	ND	10.0	3.10	ug/L	1	VMS7995	VXX14631	
Bromochloromethane	ND	1.00	0.310	ug/L	1	VMS7995	VXX14631	
Chloroform	ND	1.00	0.300	ug/L	1	VMS7995	VXX14631	
1,1,1-Trichloroethane	ND	1.00	0.310	ug/L	1	VMS7995	VXX14631	
Carbon tetrachloride	ND	1.00	0.310	ug/L	1	VMS7995	VXX14631	
1,1-Dichloropropene	ND	1.00	0.310	ug/L	1	VMS7995	VXX14631	
Benzene	ND	0.400	0.120	ug/L	1	VMS7995	VXX14631	
Trichloroethene	ND	1.00	0.310	ug/L	1	VMS7995	VXX14631	
1,2-Dichloropropane	ND	1.00	0.310	ug/L	1	VMS7995	VXX14631	
Dibromomethane	ND	1.00	0.310	ug/L	1	VMS7995	VXX14631	
Bromodichloromethane	ND	0.500	0.150	ug/L	1	VMS7995	VXX14631	
2-Chloroethyl Vinyl Ether	ND	10.0	3.10	ug/L	1	VMS7995	VXX14631	
cis-1,3-Dichloropropene	ND	0.500	0.150	ug/L	1	VMS7995	VXX14631	
Toluene	ND	1.00	0.310	ug/L	1	VMS7995	VXX14631	
trans-1,3-Dichloropropene	ND	1.00	0.310	ug/L	1	VMS7995	VXX14631	
1,1,2-Trichloroethane	ND	1.00	0.310	ug/L	1	VMS7995	VXX14631	
Tetrachloroethene	24.6	1.00	0.310	ug/L	1	VMS7995	VXX14631	
1,3-Dichloropropane	ND	0.400	0.120	ug/L	1	VMS7995	VXX14631	
Dibromochloromethane	ND	0.500	0.150	ug/L	1	VMS7995	VXX14631	
1,2-Dibromoethane	ND	1.00	0.310	ug/L	1	VMS7995	VXX14631	
Chlorobenzene	ND	0.500	0.150	ug/L	1	VMS7995	VXX14631	
1,1,1,2-Tetrachloroethane	ND	0.500	0.150	ug/L	1	VMS7995	VXX14631	
Ethylbenzene	ND	1.00	0.310	ug/L	1	VMS7995	VXX14631	



Satori Group, Inc.

Print Date: 11/15/2005

Client Sample ID: 0510FROAWA-08
SGS Ref. #: 1057045011
Project ID: Ft Richardson Groundwater
Matrix: Water (Surface, Eff., Ground)

All Dates/Times are Alaska Local Time
Collection Date/Time: 10/19/05 14:40
Receipt Date/Time: 10/20/05 11:53
Location: AP-4411

Volatile Gas Chromatography/Mass Spectroscopy

<u>Parameter</u>	<u>Result</u>	<u>PQL/CL</u>	<u>MDL</u>	<u>Units</u>	<u>DF</u>	<u>Analytical Batch</u>	<u>Prep Batch</u>	<u>Qualifiers</u>
P & M -Xylene	ND	2.00	0.620	ug/L	1	VMS7995	VXX14631	
Styrene	ND	1.00	0.310	ug/L	1	VMS7995	VXX14631	
Bromoform	ND	1.00	0.310	ug/L	1	VMS7995	VXX14631	
Isopropylbenzene (Cumene)	ND	1.00	0.310	ug/L	1	VMS7995	VXX14631	
o-Xylene	ND	1.00	0.310	ug/L	1	VMS7995	VXX14631	
Bromobenzene	ND	1.00	0.310	ug/L	1	VMS7995	VXX14631	
1,1,2,2-Tetrachloroethane	ND	0.500	0.150	ug/L	1	VMS7995	VXX14631	
1,2,3-Trichloropropane	ND	1.00	0.310	ug/L	1	VMS7995	VXX14631	
n-Propylbenzene	ND	1.00	0.310	ug/L	1	VMS7995	VXX14631	
2-Chlorotoluene	ND	1.00	0.310	ug/L	1	VMS7995	VXX14631	
4-Chlorotoluene	ND	1.00	0.310	ug/L	1	VMS7995	VXX14631	
1,3,5-Trimethylbenzene	ND	1.00	0.310	ug/L	1	VMS7995	VXX14631	
tert-Butylbenzene	ND	1.00	0.310	ug/L	1	VMS7995	VXX14631	
1,2,4-Trimethylbenzene	ND	1.00	0.310	ug/L	1	VMS7995	VXX14631	
sec-Butylbenzene	ND	1.00	0.310	ug/L	1	VMS7995	VXX14631	
4-Isopropyltoluene	ND	1.00	0.310	ug/L	1	VMS7995	VXX14631	
1,4-Dichlorobenzene	ND	0.500	0.150	ug/L	1	VMS7995	VXX14631	
1,2-Dichlorobenzene	ND	1.00	0.310	ug/L	1	VMS7995	VXX14631	
1,3-Dichlorobenzene	ND	1.00	0.310	ug/L	1	VMS7995	VXX14631	
n-Butylbenzene	ND	1.00	0.310	ug/L	1	VMS7995	VXX14631	
1,2-Dibromo-3-chloropropane	ND	2.00	0.620	ug/L	1	VMS7995	VXX14631	
1,2,4-Trichlorobenzene	ND	1.00	0.310	ug/L	1	VMS7995	VXX14631	
Hexachlorobutadiene	ND	1.00	0.310	ug/L	1	VMS7995	VXX14631	
Naphthalene	ND	2.00	0.620	ug/L	1	VMS7995	VXX14631	
1,2,3-Trichlorobenzene	ND	1.00	0.310	ug/L	1	VMS7995	VXX14631	
4-Methyl-2-pentanone (MIBK)	ND	10.0	3.10	ug/L	1	VMS7995	VXX14631	
2-Hexanone	ND	10.0	3.10	ug/L	1	VMS7995	VXX14631	
Methyl-t-butyl ether	ND	5.00	1.50	ug/L	1	VMS7995	VXX14631	
1,2-Dichloroethane	ND	0.500	0.150	ug/L	1	VMS7995	VXX14631	
Dibromofluoromethane <surr>	101	85-115		%	1	VMS7995	VXX14631	
1,2-Dichloroethane-D4 <surr>	102	72-119		%	1	VMS7995	VXX14631	
Toluene-d8 <surr>	100	85-120		%	1	VMS7995	VXX14631	
4-Bromofluorobenzene <surr>	105	76-119		%	1	VMS7995	VXX14631	



Satori Group, Inc.

Print Date: 11/15/2005

Client Sample ID: 0510FROAWA-08
SGS Ref. #: 1057045011
Project ID: Ft Richardson Groundwater
Matrix: Water (Surface, Eff., Ground)

All Dates/Times are Alaska Local Time
Collection Date/Time: 10/19/05 14:40
Receipt Date/Time: 10/20/05 11:53
Location: AP-4411

Volatile Gas Chromatography/Mass Spectroscopy

<u>Parameter</u>	<u>Result</u>	<u>PQL/CL</u>	<u>MDL</u>	<u>Units</u>	<u>DF</u>	<u>Analytical Batch</u>	<u>Prep Batch</u>	<u>Qualifiers</u>
Batch Information								
Analytical Batch: VMS7995			Prep Batch: VXX14631				Initial Prep Wt./Vol.: 5 mL	
Analytical Method: SW8260B			Prep Method: SW5030B				Prep Extract Vol.: 5 mL	
Analysis Date/Time: 10/29/05 19:58			Prep Date/Time: 10/29/05 17:00				Container ID:1057045011-A	
Dilution Factor: 1							Analyst: VS	
Analytical Batch: VMS7998			Prep Batch: VXX14631				Initial Prep Wt./Vol.: 5 mL	
Analytical Method: SW8260B			Prep Method: SW5030B				Prep Extract Vol.: 5 mL	
Analysis Date/Time: 10/31/05 13:50			Prep Date/Time: 10/29/05 17:00				Container ID:1057045011-B	
Dilution Factor: 1							Analyst: VS	



Satori Group, Inc.

Print Date: 11/15/2005

Client Sample ID: 0510FROAWA-09
SGS Ref. #: 1057045012
Project ID: Ft Richardson Groundwater
Matrix: Water (Surface, Eff., Ground)

All Dates/Times are Alaska Local Time
Collection Date/Time: 10/19/05 17:05
Receipt Date/Time: 10/20/05 11:53
Location: E Rinse

Dissolved Metals

<u>Parameter</u>	<u>Result</u>	<u>PQL/CL</u>	<u>MDL</u>	<u>Units</u>	<u>DF</u>	<u>Analytical Batch</u>	<u>Prep Batch</u>	<u>Qualifiers</u>
Aluminum	ND	100	31.0	ug/L	5	MMS3863	MXX16524	
Arsenic	ND	10.0	3.10	ug/L	5	MMS3863	MXX16524	
Iron	ND	1000	310	ug/L	5	MMS3863	MXX16524	
Manganese	ND	2.00	0.620	ug/L	5	MMS3863	MXX16524	

Batch Information

Analytical Batch: MMS3863	Prep Batch: MXX16524	Initial Prep Wt./Vol.: 100 mL
Analytical Method: SW6020 Diss.	Prep Method: FILTER	Prep Extract Vol.: 100 mL
Analysis Date/Time: 10/31/05 13:41	Prep Date/Time: 10/19/05 17:05	Container ID:1057045012-I
Dilution Factor: 5		Analyst: TK



Satori Group, Inc.

Print Date: 11/15/2005

Client Sample ID: 0510FROAWA-09
SGS Ref. #: 1057045012
Project ID: Ft Richardson Groundwater
Matrix: Water (Surface, Eff., Ground)

All Dates/Times are Alaska Local Time
Collection Date/Time: 10/19/05 17:05
Receipt Date/Time: 10/20/05 11:53
Location: E Rinse

Waters Department

<u>Parameter</u>	<u>Result</u>	<u>PQL/CL</u>	<u>MDL</u>	<u>Units</u>	<u>DF</u>	<u>Analytical Batch</u>	<u>Prep Batch</u>	<u>Qualifiers</u>
Sulfate	ND	0.100	0.0310	mg/L	1	WIC3768		
Total Nitrate/Nitrite-N	0.0560 J	0.100	0.0310	mg/L	5	WFI1073		

Batch Information

Analytical Batch: WFI1073	Initial Prep Wt./Vol.: 100 mL
Analytical Method: EPA 353.2	
Analysis Date/Time: 10/20/05 17:08	Container ID:1057045012-G
Dilution Factor: 5	Analyst: AZS
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Analytical Batch: WIC3768	Initial Prep Wt./Vol.: 5 mL
Analytical Method: EPA 300.0	
Analysis Date/Time: 10/21/05 13:59	Container ID:1057045012-H
Dilution Factor: 1	Analyst: JEM



Satori Group, Inc.

Print Date: 11/15/2005

Client Sample ID: **0510FROAWA-09**
SGS Ref. #: 1057045012
Project ID: Ft Richardson Groundwater
Matrix: Water (Surface, Eff., Ground)

All Dates/Times are Alaska Local Time
Collection Date/Time: 10/19/05 17:05
Receipt Date/Time: 10/20/05 11:53
Location: E Rinse

Light Gases

<u>Parameter</u>	<u>Result</u>	<u>PQL/CL</u>	<u>MDL</u>	<u>Units</u>	<u>DF</u>	<u>Analytical Batch</u>	<u>Prep Batch</u>	<u>Qualifiers</u>
Methane	ND	5.00	1.50	ug/L	1	GAS1263		

Batch Information

Analytical Batch: GAS1263
Analytical Method: RSK-175
Analysis Date/Time: 10/28/05 11:21
Dilution Factor: 1

Initial Prep Wt./Vol.: 1 mL
Container ID: 1057045012-D
Analyst: KWM



Satori Group, Inc.

Print Date: 11/15/2005

Client Sample ID: 0510FROAWA-09
SGS Ref. #: 1057045012
Project ID: Ft Richardson Groundwater
Matrix: Water (Surface, Eff., Ground)

All Dates/Times are Alaska Local Time
Collection Date/Time: 10/19/05 17:05
Receipt Date/Time: 10/20/05 11:53
Location: E Rinse

Volatile Gas Chromatography/Mass Spectroscopy

<u>Parameter</u>	<u>Result</u>	<u>PQL/CL</u>	<u>MDL</u>	<u>Units</u>	<u>DF</u>	<u>Analytical Batch</u>	<u>Prep Batch</u>	<u>Qualifiers</u>
Dichlorodifluoromethane	ND	1.00	0.310	ug/L	1	VMS7995	VXX14631	
Chloromethane	ND	1.00	0.310	ug/L	1	VMS7995	VXX14631	
Vinyl chloride	ND	1.00	0.310	ug/L	1	VMS7995	VXX14631	
Bromomethane	ND	3.00	0.940	ug/L	1	VMS7995	VXX14631	
Chloroethane	ND	1.00	0.310	ug/L	1	VMS7995	VXX14631	
1,1-Dichloroethene	ND	1.00	0.310	ug/L	1	VMS7995	VXX14631	
Trichlorofluoromethane	ND	1.00	0.310	ug/L	1	VMS7995	VXX14631	
Methylene chloride	ND	5.00	1.00	ug/L	1	VMS7995	VXX14631	
Carbon disulfide	ND	2.00	0.620	ug/L	1	VMS7995	VXX14631	
Acetone	ND	10.0	3.10	ug/L	1	VMS7995	VXX14631	
trans-1,2-Dichloroethene	ND	1.00	0.310	ug/L	1	VMS7995	VXX14631	
1,1-Dichloroethane	ND	1.00	0.310	ug/L	1	VMS7995	VXX14631	
2,2-Dichloropropane	ND	1.00	0.310	ug/L	1	VMS7995	VXX14631	
cis-1,2-Dichloroethene	ND	1.00	0.310	ug/L	1	VMS7995	VXX14631	
2-Butanone (MEK)	ND	10.0	3.10	ug/L	1	VMS7995	VXX14631	
Bromochloromethane	ND	1.00	0.310	ug/L	1	VMS7995	VXX14631	
Chloroform	ND	1.00	0.300	ug/L	1	VMS7995	VXX14631	
1,1,1-Trichloroethane	ND	1.00	0.310	ug/L	1	VMS7995	VXX14631	
Carbon tetrachloride	ND	1.00	0.310	ug/L	1	VMS7995	VXX14631	
1,1-Dichloropropene	ND	1.00	0.310	ug/L	1	VMS7995	VXX14631	
Benzene	ND	0.400	0.120	ug/L	1	VMS7995	VXX14631	
Trichloroethene	ND	1.00	0.310	ug/L	1	VMS7995	VXX14631	
1,2-Dichloropropane	ND	1.00	0.310	ug/L	1	VMS7995	VXX14631	
Dibromomethane	ND	1.00	0.310	ug/L	1	VMS7995	VXX14631	
Bromodichloromethane	ND	0.500	0.150	ug/L	1	VMS7995	VXX14631	
2-Chloroethyl Vinyl Ether	ND	10.0	3.10	ug/L	1	VMS7995	VXX14631	
cis-1,3-Dichloropropene	ND	0.500	0.150	ug/L	1	VMS7995	VXX14631	
Toluene	0.370 J	1.00	0.310	ug/L	1	VMS7998	VXX14631	
trans-1,3-Dichloropropene	ND	1.00	0.310	ug/L	1	VMS7995	VXX14631	
1,1,2-Trichloroethane	ND	1.00	0.310	ug/L	1	VMS7995	VXX14631	
Tetrachloroethene	ND	1.00	0.310	ug/L	1	VMS7995	VXX14631	
1,3-Dichloropropane	ND	0.400	0.120	ug/L	1	VMS7995	VXX14631	
Dibromochloromethane	ND	0.500	0.150	ug/L	1	VMS7995	VXX14631	
1,2-Dibromoethane	ND	1.00	0.310	ug/L	1	VMS7995	VXX14631	
Chlorobenzene	ND	0.500	0.150	ug/L	1	VMS7995	VXX14631	
1,1,1,2-Tetrachloroethane	ND	0.500	0.150	ug/L	1	VMS7995	VXX14631	
Ethylbenzene	ND	1.00	0.310	ug/L	1	VMS7995	VXX14631	



Satori Group, Inc.

Print Date: 11/15/2005

Client Sample ID: **0510FROAWA-09**
SGS Ref. #: 1057045012
Project ID: Ft Richardson Groundwater
Matrix: Water (Surface, Eff., Ground)

All Dates/Times are Alaska Local Time
Collection Date/Time: 10/19/05 17:05
Receipt Date/Time: 10/20/05 11:53
Location: E Rinse

Volatile Gas Chromatography/Mass Spectroscopy

<u>Parameter</u>	<u>Result</u>	<u>PQL/CL</u>	<u>MDL</u>	<u>Units</u>	<u>DF</u>	<u>Analytical Batch</u>	<u>Prep Batch</u>	<u>Qualifiers</u>
P & M -Xylene	ND	2.00	0.620	ug/L	1	VMS7995	VXX14631	
Styrene	ND	1.00	0.310	ug/L	1	VMS7995	VXX14631	
Bromoform	ND	1.00	0.310	ug/L	1	VMS7995	VXX14631	
Isopropylbenzene (Cumene)	ND	1.00	0.310	ug/L	1	VMS7995	VXX14631	
o-Xylene	ND	1.00	0.310	ug/L	1	VMS7995	VXX14631	
Bromobenzene	ND	1.00	0.310	ug/L	1	VMS7995	VXX14631	
1,1,2,2-Tetrachloroethane	ND	0.500	0.150	ug/L	1	VMS7995	VXX14631	
1,2,3-Trichloropropane	ND	1.00	0.310	ug/L	1	VMS7995	VXX14631	
n-Propylbenzene	ND	1.00	0.310	ug/L	1	VMS7995	VXX14631	
2-Chlorotoluene	ND	1.00	0.310	ug/L	1	VMS7995	VXX14631	
4-Chlorotoluene	ND	1.00	0.310	ug/L	1	VMS7995	VXX14631	
1,3,5-Trimethylbenzene	ND	1.00	0.310	ug/L	1	VMS7995	VXX14631	
tert-Butylbenzene	ND	1.00	0.310	ug/L	1	VMS7995	VXX14631	
1,2,4-Trimethylbenzene	ND	1.00	0.310	ug/L	1	VMS7995	VXX14631	
sec-Butylbenzene	ND	1.00	0.310	ug/L	1	VMS7995	VXX14631	
4-Isopropyltoluene	ND	1.00	0.310	ug/L	1	VMS7995	VXX14631	
1,4-Dichlorobenzene	ND	0.500	0.150	ug/L	1	VMS7995	VXX14631	
1,2-Dichlorobenzene	ND	1.00	0.310	ug/L	1	VMS7995	VXX14631	
1,3-Dichlorobenzene	ND	1.00	0.310	ug/L	1	VMS7995	VXX14631	
n-Butylbenzene	ND	1.00	0.310	ug/L	1	VMS7995	VXX14631	
1,2-Dibromo-3-chloropropane	ND	2.00	0.620	ug/L	1	VMS7995	VXX14631	
1,2,4-Trichlorobenzene	ND	1.00	0.310	ug/L	1	VMS7995	VXX14631	
Hexachlorobutadiene	ND	1.00	0.310	ug/L	1	VMS7995	VXX14631	
Naphthalene	ND	2.00	0.620	ug/L	1	VMS7995	VXX14631	
1,2,3-Trichlorobenzene	ND	1.00	0.310	ug/L	1	VMS7995	VXX14631	
4-Methyl-2-pentanone (MIBK)	ND	10.0	3.10	ug/L	1	VMS7995	VXX14631	
2-Hexanone	ND	10.0	3.10	ug/L	1	VMS7995	VXX14631	
Methyl-t-butyl ether	ND	5.00	1.50	ug/L	1	VMS7995	VXX14631	
1,2-Dichloroethane	ND	0.500	0.150	ug/L	1	VMS7995	VXX14631	
Dibromofluoromethane <surr>	101	85-115		%	1	VMS7995	VXX14631	
1,2-Dichloroethane-D4 <surr>	102	72-119		%	1	VMS7995	VXX14631	
Toluene-d8 <surr>	103	85-120		%	1	VMS7995	VXX14631	
4-Bromofluorobenzene <surr>	108	76-119		%	1	VMS7995	VXX14631	



Satori Group, Inc.

Print Date: 11/15/2005

Client Sample ID: **0510FROAWA-09**
SGS Ref. #: 1057045012
Project ID: Ft Richardson Groundwater
Matrix: Water (Surface, Eff., Ground)

All Dates/Times are Alaska Local Time
Collection Date/Time: 10/19/05 17:05
Receipt Date/Time: 10/20/05 11:53
Location: E Rinse

Volatile Gas Chromatography/Mass Spectroscopy

<u>Parameter</u>	<u>Result</u>	<u>PQL/CL</u>	<u>MDL</u>	<u>Units</u>	<u>DF</u>	<u>Analytical Batch</u>	<u>Prep Batch</u>	<u>Qualifiers</u>
Batch Information								
Analytical Batch: VMS7995			Prep Batch: VXX14631					Initial Prep Wt./Vol.: 5 mL
Analytical Method: SW8260B			Prep Method: SW5030B					Prep Extract Vol.: 5 mL
Analysis Date/Time: 10/29/05 20:33			Prep Date/Time: 10/29/05 17:00					Container ID:1057045012-A
Dilution Factor: 1								Analyst: VS
<hr/>								
Analytical Batch: VMS7998			Prep Batch: VXX14631					Initial Prep Wt./Vol.: 5 mL
Analytical Method: SW8260B			Prep Method: SW5030B					Prep Extract Vol.: 5 mL
Analysis Date/Time: 10/31/05 14:26			Prep Date/Time: 10/29/05 17:00					Container ID:1057045012-B
Dilution Factor: 1								Analyst: VS



Satori Group, Inc.

Print Date: 11/15/2005

Client Sample ID: **0510FROAWA-10**
SGS Ref. #: 1057045013
Project ID: Ft Richardson Groundwater
Matrix: Water (Surface, Eff., Ground)

All Dates/Times are Alaska Local Time
Collection Date/Time: 10/19/05 17:35
Receipt Date/Time: 10/20/05 11:53
Location: AP-4413

Dissolved Metals

<u>Parameter</u>	<u>Result</u>	<u>PQL/CL</u>	<u>MDL</u>	<u>Units</u>	<u>DF</u>	<u>Analytical Batch</u>	<u>Prep Batch</u>	<u>Qualifiers</u>
Aluminum	ND	100	31.0	ug/L	5	MMS3863	MXX16524	
Arsenic	ND	10.0	3.10	ug/L	5	MMS3863	MXX16524	
Iron	ND	1000	310	ug/L	5	MMS3863	MXX16524	
Manganese	0.709 J	2.00	0.620	ug/L	5	MMS3863	MXX16524	

Batch Information

Analytical Batch: MMS3863
Analytical Method: SW6020 Diss.
Analysis Date/Time: 10/31/05 14:01
Dilution Factor: 5

Prep Batch: MXX16524
Prep Method: FILTER
Prep Date/Time: 10/19/05 17:35

Initial Prep Wt./Vol.: 100 mL
Prep Extract Vol.: 100 mL
Container ID: 1057045013-I
Analyst: TK



Satori Group, Inc.

Print Date: 11/15/2005

Client Sample ID: 0510FROAWA-10
SGS Ref. #: 1057045013
Project ID: Ft Richardson Groundwater
Matrix: Water (Surface, Eff., Ground)

All Dates/Times are Alaska Local Time
Collection Date/Time: 10/19/05 17:35
Receipt Date/Time: 10/20/05 11:53
Location: AP-4413

Waters Department

<u>Parameter</u>	<u>Result</u>	<u>PQL/CL</u>	<u>MDL</u>	<u>Units</u>	<u>DF</u>	<u>Analytical Batch</u>	<u>Prep Batch</u>	<u>Qualifiers</u>
Sulfate	23.9	0.100	0.0310	mg/L	1	WIC3768		
Total Nitrate/Nitrite-N	3.47	0.100	0.0310	mg/L	5	WFI1073		

Batch Information

Analytical Batch: WFI1073	Initial Prep Wt./Vol.: 100 mL
Analytical Method: EPA 353.2	
Analysis Date/Time: 10/20/05 17:10	Container ID:1057045013-G
Dilution Factor: 5	Analyst: AZS
Analytical Batch: WIC3768	Initial Prep Wt./Vol.: 5 mL
Analytical Method: EPA 300.0	
Analysis Date/Time: 10/21/05 14:17	Container ID:1057045013-H
Dilution Factor: 1	Analyst: JEM



Satori Group, Inc.

Print Date: 11/15/2005

Client Sample ID: **0510FROAWA-10**
SGS Ref. #: 1057045013
Project ID: Ft Richardson Groundwater
Matrix: Water (Surface, Eff., Ground)

All Dates/Times are Alaska Local Time
Collection Date/Time: 10/19/05 17:35
Receipt Date/Time: 10/20/05 11:53
Location: AP-4413

Light Gases

<u>Parameter</u>	<u>Result</u>	<u>PQL/CL</u>	<u>MDL</u>	<u>Units</u>	<u>DF</u>	<u>Analytical Batch</u>	<u>Prep Batch</u>	<u>Qualifiers</u>
Methane	ND	5.00	1.50	ug/L	1	GAS1263		

Batch Information

Analytical Batch: GAS1263
Analytical Method: RSK-175
Analysis Date/Time: 10/28/05 11:28
Dilution Factor: 1

Initial Prep Wt./Vol.: 1 mL
Container ID:1057045013-D
Analyst: KWM



Satori Group, Inc.

Print Date: 11/15/2005

Client Sample ID: **0510FROAWA-10**
 SGS Ref. #: 1057045013
 Project ID: Ft Richardson Groundwater
 Matrix: Water (Surface, Eff., Ground)

All Dates/Times are Alaska Local Time
 Collection Date/Time: 10/19/05 17:35
 Receipt Date/Time: 10/20/05 11:53
 Location: AP-4413

Volatile Gas Chromatography/Mass Spectroscopy

<u>Parameter</u>	<u>Result</u>	<u>PQL/CL</u>	<u>MDL</u>	<u>Units</u>	<u>DF</u>	<u>Analytical Batch</u>	<u>Prep Batch</u>	<u>Qualifiers</u>
Dichlorodifluoromethane	ND	1.00	0.310	ug/L	1	VMS7995	VXX14631	
Chloromethane	ND	1.00	0.310	ug/L	1	VMS7995	VXX14631	
Vinyl chloride	ND	1.00	0.310	ug/L	1	VMS7995	VXX14631	
Bromomethane	ND	3.00	0.940	ug/L	1	VMS7995	VXX14631	
Chloroethane	ND	1.00	0.310	ug/L	1	VMS7995	VXX14631	
Trichlorofluoromethane	ND	1.00	0.310	ug/L	1	VMS7995	VXX14631	
1,1-Dichloroethene	ND	1.00	0.310	ug/L	1	VMS7995	VXX14631	
Methylene chloride	ND	5.00	1.00	ug/L	1	VMS7995	VXX14631	
Carbon disulfide	ND	2.00	0.620	ug/L	1	VMS7995	VXX14631	
Acetone	ND	10.0	3.10	ug/L	1	VMS7995	VXX14631	
trans-1,2-Dichloroethene	ND	1.00	0.310	ug/L	1	VMS7995	VXX14631	
1,1-Dichloroethane	ND	1.00	0.310	ug/L	1	VMS7995	VXX14631	
2,2-Dichloropropane	ND	1.00	0.310	ug/L	1	VMS7995	VXX14631	
cis-1,2-Dichloroethene	ND	1.00	0.310	ug/L	1	VMS7995	VXX14631	
2-Butanone (MEK)	ND	10.0	3.10	ug/L	1	VMS7995	VXX14631	
Bromochloromethane	ND	1.00	0.310	ug/L	1	VMS7995	VXX14631	
Chloroform	0.660 J	1.00	0.300	ug/L	1	VMS7995	VXX14631	
1,1,1-Trichloroethane	ND	1.00	0.310	ug/L	1	VMS7995	VXX14631	
Carbon tetrachloride	1.08	1.00	0.310	ug/L	1	VMS7995	VXX14631	
1,1-Dichloropropene	ND	1.00	0.310	ug/L	1	VMS7995	VXX14631	
Benzene	ND	0.400	0.120	ug/L	1	VMS7995	VXX14631	
Trichloroethene	ND	1.00	0.310	ug/L	1	VMS7995	VXX14631	
1,2-Dichloropropane	ND	1.00	0.310	ug/L	1	VMS7995	VXX14631	
Dibromomethane	ND	1.00	0.310	ug/L	1	VMS7995	VXX14631	
Bromodichloromethane	ND	0.500	0.150	ug/L	1	VMS7995	VXX14631	
2-Chloroethyl Vinyl Ether	ND	10.0	3.10	ug/L	1	VMS7995	VXX14631	
cis-1,3-Dichloropropene	ND	0.500	0.150	ug/L	1	VMS7995	VXX14631	
Toluene	ND	1.00	0.310	ug/L	1	VMS7995	VXX14631	
trans-1,3-Dichloropropene	ND	1.00	0.310	ug/L	1	VMS7998	VXX14631	
1,1,2-Trichloroethane	ND	1.00	0.310	ug/L	1	VMS7995	VXX14631	
Tetrachloroethene	143	10.0	3.10	ug/L	10	VMS7998	VXX14631	
1,3-Dichloropropane	ND	0.400	0.120	ug/L	1	VMS7995	VXX14631	
Dibromochloromethane	ND	0.500	0.150	ug/L	1	VMS7995	VXX14631	
1,2-Dibromoethane	ND	1.00	0.310	ug/L	1	VMS7995	VXX14631	
Chlorobenzene	ND	0.500	0.150	ug/L	1	VMS7995	VXX14631	
1,1,1,2-Tetrachloroethane	ND	0.500	0.150	ug/L	1	VMS7995	VXX14631	
Ethylbenzene	ND	1.00	0.310	ug/L	1	VMS7995	VXX14631	



Satori Group, Inc.

Print Date: 11/15/2005

Client Sample ID: **0510FROAWA-10**
 SGS Ref. #: 1057045013
 Project ID: Ft Richardson Groundwater
 Matrix: Water (Surface, Eff., Ground)

All Dates/Times are Alaska Local Time
 Collection Date/Time: 10/19/05 17:35
 Receipt Date/Time: 10/20/05 11:53
 Location: AP-4413

Volatile Gas Chromatography/Mass Spectroscopy

<u>Parameter</u>	<u>Result</u>	<u>PQL/CL</u>	<u>MDL</u>	<u>Units</u>	<u>DF</u>	<u>Analytical Batch</u>	<u>Prep Batch</u>	<u>Qualifiers</u>
P & M -Xylene	ND	2.00	0.620	ug/L	1	VMS7995	VXX14631	
Styrene	ND	1.00	0.310	ug/L	1	VMS7995	VXX14631	
Bromoform	ND	1.00	0.310	ug/L	1	VMS7995	VXX14631	
Isopropylbenzene (Cumene)	ND	1.00	0.310	ug/L	1	VMS7995	VXX14631	
o-Xylene	ND	1.00	0.310	ug/L	1	VMS7995	VXX14631	
Bromobenzene	ND	1.00	0.310	ug/L	1	VMS7995	VXX14631	
1,2,3-Trichloropropane	ND	1.00	0.310	ug/L	1	VMS7995	VXX14631	
n-Propylbenzene	ND	1.00	0.310	ug/L	1	VMS7995	VXX14631	
2-Chlorotoluene	ND	1.00	0.310	ug/L	1	VMS7995	VXX14631	
4-Chlorotoluene	ND	1.00	0.310	ug/L	1	VMS7995	VXX14631	
1,1,2,2-Tetrachloroethane	ND	0.500	0.150	ug/L	1	VMS7995	VXX14631	
1,3,5-Trimethylbenzene	ND	1.00	0.310	ug/L	1	VMS7995	VXX14631	
tert-Butylbenzene	ND	1.00	0.310	ug/L	1	VMS7995	VXX14631	
1,2,4-Trimethylbenzene	ND	1.00	0.310	ug/L	1	VMS7995	VXX14631	
sec-Butylbenzene	ND	1.00	0.310	ug/L	1	VMS7995	VXX14631	
4-Isopropyltoluene	ND	1.00	0.310	ug/L	1	VMS7995	VXX14631	
1,4-Dichlorobenzene	ND	0.500	0.150	ug/L	1	VMS7995	VXX14631	
1,2-Dichlorobenzene	ND	1.00	0.310	ug/L	1	VMS7995	VXX14631	
n-Butylbenzene	ND	1.00	0.310	ug/L	1	VMS7995	VXX14631	
1,3-Dichlorobenzene	ND	1.00	0.310	ug/L	1	VMS7995	VXX14631	
1,2-Dibromo-3-chloropropane	ND	2.00	0.620	ug/L	1	VMS7995	VXX14631	
1,2,4-Trichlorobenzene	ND	1.00	0.310	ug/L	1	VMS7995	VXX14631	
Hexachlorobutadiene	ND	1.00	0.310	ug/L	1	VMS7995	VXX14631	
Naphthalene	ND	2.00	0.620	ug/L	1	VMS7995	VXX14631	
1,2,3-Trichlorobenzene	ND	1.00	0.310	ug/L	1	VMS7995	VXX14631	
4-Methyl-2-pentanone (MIBK)	ND	10.0	3.10	ug/L	1	VMS7995	VXX14631	
2-Hexanone	ND	10.0	3.10	ug/L	1	VMS7995	VXX14631	
Methyl-t-butyl ether	ND	5.00	1.50	ug/L	1	VMS7995	VXX14631	
1,2-Dichloroethane	ND	0.500	0.150	ug/L	1	VMS7995	VXX14631	
Dibromofluoromethane <surr>	102	85-115		%	1	VMS7995	VXX14631	
1,2-Dichloroethane-D4 <surr>	103	72-119		%	1	VMS7995	VXX14631	
Toluene-d8 <surr>	106	85-120		%	1	VMS7995	VXX14631	
4-Bromofluorobenzene <surr>	116	76-119		%	1	VMS7995	VXX14631	



Satori Group, Inc.

Print Date: 11/15/2005

Client Sample ID: 0510FROAWA-10
SGS Ref. #: 1057045013
Project ID: Ft Richardson Groundwater
Matrix: Water (Surface, Eff., Ground)

All Dates/Times are Alaska Local Time
Collection Date/Time: 10/19/05 17:35
Receipt Date/Time: 10/20/05 11:53
Location: AP-4413

Volatile Gas Chromatography/Mass Spectroscopy

<u>Parameter</u>	<u>Result</u>	<u>PQL/CL</u>	<u>MDL</u>	<u>Units</u>	<u>DF</u>	<u>Analytical Batch</u>	<u>Prep Batch</u>	<u>Qualifiers</u>
Batch Information								
Analytical Batch: VMS7995			Prep Batch: VXX14631					Initial Prep Wt./Vol.: 5 mL
Analytical Method: SW8260B			Prep Method: SW5030B					Prep Extract Vol.: 5 mL
Analysis Date/Time: 10/29/05 21:09			Prep Date/Time: 10/29/05 17:00					Container ID:1057045013-A
Dilution Factor: 1								Analyst: VS
Analytical Batch: VMS7998			Prep Batch: VXX14631					Initial Prep Wt./Vol.: 5 mL
Analytical Method: SW8260B			Prep Method: SW5030B					Prep Extract Vol.: 5 mL
Analysis Date/Time: 10/31/05 15:01			Prep Date/Time: 10/29/05 17:00					Container ID:1057045013-B
Dilution Factor: 10								Analyst: VS
Analytical Batch: VMS7998			Prep Batch: VXX14631					Initial Prep Wt./Vol.: 5 mL
Analytical Method: SW8260B			Prep Method: SW5030B					Prep Extract Vol.: 5 mL
Analysis Date/Time: 11/01/05 00:31			Prep Date/Time: 10/29/05 17:00					Container ID:1057045013-B
Dilution Factor: 1								Analyst: VS



Satori Group, Inc.

Print Date: 11/15/2005

Client Sample ID: **0510FROAWA-11**
SGS Ref. #: 1057045014
Project ID: Ft Richardson Groundwater
Matrix: Water (Surface, Eff., Ground)

All Dates/Times are Alaska Local Time
Collection Date/Time: 10/19/05 17:50
Receipt Date/Time: 10/20/05 11:53
Location: AP-4341

Dissolved Metals

<u>Parameter</u>	<u>Result</u>	<u>PQL/CL</u>	<u>MDL</u>	<u>Units</u>	<u>DF</u>	<u>Analytical Batch</u>	<u>Prep Batch</u>	<u>Qualifiers</u>
Aluminum	ND	100	31.0	ug/L	5	MMS3863	MXX16524	
Arsenic	ND	10.0	3.10	ug/L	5	MMS3863	MXX16524	
Iron	ND	1000	310	ug/L	5	MMS3863	MXX16524	
Manganese	14.4	2.00	0.620	ug/L	5	MMS3863	MXX16524	

Batch Information

Analytical Batch: MMS3863
Analytical Method: SW6020 Diss.
Analysis Date/Time: 10/31/05 14:05
Dilution Factor: 5

Prep Batch: MXX16524
Prep Method: FILTER
Prep Date/Time: 10/19/05 17:50

Initial Prep Wt./Vol.: 100 mL
Prep Extract Vol.: 100 mL
Container ID:1057045014-I
Analyst: TK



Satori Group, Inc.

Print Date: 11/15/2005

Client Sample ID: **0510FROAWA-11**
SGS Ref. #: 1057045014
Project ID: Ft Richardson Groundwater
Matrix: Water (Surface, Eff., Ground)

All Dates/Times are Alaska Local Time
Collection Date/Time: 10/19/05 17:50
Receipt Date/Time: 10/20/05 11:53
Location: AP-4341

Waters Department

<u>Parameter</u>	<u>Result</u>	<u>PQL/CL</u>	<u>MDL</u>	<u>Units</u>	<u>DF</u>	<u>Analytical Batch</u>	<u>Prep Batch</u>	<u>Qualifiers</u>
Sulfate	22.0	0.100	0.0310	mg/L	1	WIC3768		
Total Nitrate/Nitrite-N	3.31	0.100	0.0310	mg/L	5	WFI1073		

Batch Information

Analytical Batch: WFI1073	Initial Prep Wt./Vol.: 100 mL
Analytical Method: EPA 353.2	
Analysis Date/Time: 10/20/05 17:11	Container ID:1057045014-G
Dilution Factor: 5	Analyst: AZS
<hr/>	
Analytical Batch: WIC3768	Initial Prep Wt./Vol.: 5 mL
Analytical Method: EPA 300.0	
Analysis Date/Time: 10/21/05 14:36	Container ID:1057045014-H
Dilution Factor: 1	Analyst: JEM



Satori Group, Inc.

Print Date: 11/15/2005

Client Sample ID: **0510FROAWA-11**
SGS Ref. #: 1057045014
Project ID: Ft Richardson Groundwater
Matrix: Water (Surface, Eff., Ground)

All Dates/Times are Alaska Local Time
Collection Date/Time: 10/19/05 17:50
Receipt Date/Time: 10/20/05 11:53
Location: AP-4341

Light Gases

<u>Parameter</u>	<u>Result</u>	<u>PQL/CL</u>	<u>MDL</u>	<u>Units</u>	<u>DF</u>	<u>Analytical Batch</u>	<u>Prep Batch</u>	<u>Qualifiers</u>
Methane	ND	5.00	1.50	ug/L	1	GAS1263		

Batch Information

Analytical Batch: GAS1263
Analytical Method: RSK-175
Analysis Date/Time: 10/28/05 11:37
Dilution Factor: 1

Initial Prep Wt./Vol.: 1 mL
Container ID:1057045014-D
Analyst: KWM



Satori Group, Inc.

Print Date: 11/15/2005

Client Sample ID: 0510FROAWA-11
SGS Ref. #: 1057045014
Project ID: Ft Richardson Groundwater
Matrix: Water (Surface, Eff., Ground)

All Dates/Times are Alaska Local Time
Collection Date/Time: 10/19/05 17:50
Receipt Date/Time: 10/20/05 11:53
Location: AP-4341

Volatile Gas Chromatography/Mass Spectroscopy

<u>Parameter</u>	<u>Result</u>	<u>PQL/CL</u>	<u>MDL</u>	<u>Units</u>	<u>DF</u>	<u>Analytical Batch</u>	<u>Prep Batch</u>	<u>Qualifiers</u>
Dichlorodifluoromethane	ND	1.00	0.310	ug/L	1	VMS7995	VXX14631	
Chloromethane	ND	1.00	0.310	ug/L	1	VMS7995	VXX14631	
Vinyl chloride	ND	1.00	0.310	ug/L	1	VMS7995	VXX14631	
Bromomethane	ND	3.00	0.940	ug/L	1	VMS7995	VXX14631	
Chloroethane	ND	1.00	0.310	ug/L	1	VMS7995	VXX14631	
Trichlorofluoromethane	ND	1.00	0.310	ug/L	1	VMS7995	VXX14631	
1,1-Dichloroethene	ND	1.00	0.310	ug/L	1	VMS7995	VXX14631	
Methylene chloride	ND	5.00	1.00	ug/L	1	VMS7995	VXX14631	
Carbon disulfide	ND	2.00	0.620	ug/L	1	VMS7995	VXX14631	
Acetone	ND	10.0	3.10	ug/L	1	VMS7995	VXX14631	
trans-1,2-Dichloroethene	ND	1.00	0.310	ug/L	1	VMS7995	VXX14631	
1,1-Dichloroethane	ND	1.00	0.310	ug/L	1	VMS7995	VXX14631	
2,2-Dichloropropane	ND	1.00	0.310	ug/L	1	VMS7995	VXX14631	
cis-1,2-Dichloroethene	ND	1.00	0.310	ug/L	1	VMS7995	VXX14631	
Bromochloromethane	ND	1.00	0.310	ug/L	1	VMS7995	VXX14631	
2-Butanone (MEK)	ND	10.0	3.10	ug/L	1	VMS7995	VXX14631	
Chloroform	0.780 J	1.00	0.300	ug/L	1	VMS7995	VXX14631	
1,1,1-Trichloroethane	ND	1.00	0.310	ug/L	1	VMS7995	VXX14631	
Carbon tetrachloride	0.370 J	1.00	0.310	ug/L	1	VMS7995	VXX14631	
1,1-Dichloropropene	ND	1.00	0.310	ug/L	1	VMS7995	VXX14631	
Benzene	ND	0.400	0.120	ug/L	1	VMS7995	VXX14631	
Trichloroethene	ND	1.00	0.310	ug/L	1	VMS7995	VXX14631	
1,2-Dichloropropane	ND	1.00	0.310	ug/L	1	VMS7995	VXX14631	
Dibromomethane	ND	1.00	0.310	ug/L	1	VMS7995	VXX14631	
Bromodichloromethane	ND	0.500	0.150	ug/L	1	VMS7995	VXX14631	
2-Chloroethyl Vinyl Ether	ND	10.0	3.10	ug/L	1	VMS7995	VXX14631	
cis-1,3-Dichloropropene	ND	0.500	0.150	ug/L	1	VMS7995	VXX14631	
Toluene	ND	1.00	0.310	ug/L	1	VMS7998	VXX14631	
trans-1,3-Dichloropropene	ND	1.00	0.310	ug/L	1	VMS7995	VXX14631	
1,1,2-Trichloroethane	ND	1.00	0.310	ug/L	1	VMS7995	VXX14631	
Tetrachloroethene	19.0	1.00	0.310	ug/L	1	VMS7995	VXX14631	
1,3-Dichloropropane	ND	0.400	0.120	ug/L	1	VMS7995	VXX14631	
Dibromochloromethane	ND	0.500	0.150	ug/L	1	VMS7995	VXX14631	
1,2-Dibromoethane	ND	1.00	0.310	ug/L	1	VMS7995	VXX14631	
Chlorobenzene	ND	0.500	0.150	ug/L	1	VMS7995	VXX14631	
1,1,1,2-Tetrachloroethane	ND	0.500	0.150	ug/L	1	VMS7995	VXX14631	
Ethylbenzene	ND	1.00	0.310	ug/L	1	VMS7995	VXX14631	



Satori Group, Inc.

Print Date: 11/15/2005

Client Sample ID: **0510FROAWA-11**
 SGS Ref. #: 1057045014
 Project ID: Ft Richardson Groundwater
 Matrix: Water (Surface, Eff., Ground)

All Dates/Times are Alaska Local Time
 Collection Date/Time: 10/19/05 17:50
 Receipt Date/Time: 10/20/05 11:53
 Location: AP-4341

Volatile Gas Chromatography/Mass Spectroscopy

<u>Parameter</u>	<u>Result</u>	<u>PQL/CL</u>	<u>MDL</u>	<u>Units</u>	<u>DF</u>	<u>Analytical Batch</u>	<u>Prep Batch</u>	<u>Qualifiers</u>
P & M -Xylene	ND	2.00	0.620	ug/L	1	VMS7995	VXX14631	
Styrene	ND	1.00	0.310	ug/L	1	VMS7995	VXX14631	
Bromoform	ND	1.00	0.310	ug/L	1	VMS7995	VXX14631	
Isopropylbenzene (Cumene)	ND	1.00	0.310	ug/L	1	VMS7995	VXX14631	
Bromobenzene	ND	1.00	0.310	ug/L	1	VMS7995	VXX14631	
o-Xylene	ND	1.00	0.310	ug/L	1	VMS7995	VXX14631	
1,2,3-Trichloropropane	ND	1.00	0.310	ug/L	1	VMS7995	VXX14631	
n-Propylbenzene	ND	1.00	0.310	ug/L	1	VMS7995	VXX14631	
2-Chlorotoluene	ND	1.00	0.310	ug/L	1	VMS7995	VXX14631	
1,1,1,2-Tetrachloroethane	ND	0.500	0.150	ug/L	1	VMS7995	VXX14631	
4-Chlorotoluene	ND	1.00	0.310	ug/L	1	VMS7995	VXX14631	
1,3,5-Trimethylbenzene	ND	1.00	0.310	ug/L	1	VMS7995	VXX14631	
tert-Butylbenzene	ND	1.00	0.310	ug/L	1	VMS7995	VXX14631	
1,2,4-Trimethylbenzene	ND	1.00	0.310	ug/L	1	VMS7995	VXX14631	
sec-Butylbenzene	ND	1.00	0.310	ug/L	1	VMS7995	VXX14631	
4-Isopropyltoluene	ND	1.00	0.310	ug/L	1	VMS7995	VXX14631	
1,4-Dichlorobenzene	ND	0.500	0.150	ug/L	1	VMS7995	VXX14631	
1,2-Dichlorobenzene	ND	1.00	0.310	ug/L	1	VMS7995	VXX14631	
1,3-Dichlorobenzene	ND	1.00	0.310	ug/L	1	VMS7995	VXX14631	
n-Butylbenzene	ND	1.00	0.310	ug/L	1	VMS7995	VXX14631	
1,2-Dibromo-3-chloropropane	ND	2.00	0.620	ug/L	1	VMS7995	VXX14631	
1,2,4-Trichlorobenzene	ND	1.00	0.310	ug/L	1	VMS7995	VXX14631	
Hexachlorobutadiene	ND	1.00	0.310	ug/L	1	VMS7995	VXX14631	
Naphthalene	ND	2.00	0.620	ug/L	1	VMS7995	VXX14631	
1,2,3-Trichlorobenzene	ND	1.00	0.310	ug/L	1	VMS7995	VXX14631	
4-Methyl-2-pentanone (MIBK)	ND	10.0	3.10	ug/L	1	VMS7995	VXX14631	
2-Hexanone	ND	10.0	3.10	ug/L	1	VMS7995	VXX14631	
Methyl-t-butyl ether	ND	5.00	1.50	ug/L	1	VMS7995	VXX14631	
1,2-Dichloroethane	ND	0.500	0.150	ug/L	1	VMS7995	VXX14631	
Dibromofluoromethane <surr>	98.7	85-115		%	1	VMS7995	VXX14631	
1,2-Dichloroethane-D4 <surr>	99.5	72-119		%	1	VMS7995	VXX14631	
Toluene-d8 <surr>	104	85-120		%	1	VMS7995	VXX14631	
4-Bromofluorobenzene <surr>	111	76-119		%	1	VMS7995	VXX14631	



Satori Group, Inc.

Print Date: 11/15/2005

Client Sample ID: **0510FROAWA-11**
SGS Ref. #: 1057045014
Project ID: Ft Richardson Groundwater
Matrix: Water (Surface, Eff., Ground)

All Dates/Times are Alaska Local Time
Collection Date/Time: 10/19/05 17:50
Receipt Date/Time: 10/20/05 11:53
Location: AP-4341

Volatile Gas Chromatography/Mass Spectroscopy

<u>Parameter</u>	<u>Result</u>	<u>PQL/CL</u>	<u>MDL</u>	<u>Units</u>	<u>DF</u>	<u>Analytical</u> <u>Batch</u>	<u>Prep</u> <u>Batch</u>	<u>Qualifiers</u>
Batch Information								
Analytical Batch: VMS7995			Prep Batch: VXX14631				Initial Prep Wt./Vol.: 5 mL	
Analytical Method: SW8260B			Prep Method: SW5030B				Prep Extract Vol.: 5 mL	
Analysis Date/Time: 10/29/05 21:45			Prep Date/Time: 10/29/05 17:00				Container ID:1057045014-A	
Dilution Factor: 1							Analyst: VS	
Analytical Batch: VMS7998			Prep Batch: VXX14631				Initial Prep Wt./Vol.: 5 mL	
Analytical Method: SW8260B			Prep Method: SW5030B				Prep Extract Vol.: 5 mL	
Analysis Date/Time: 10/31/05 23:20			Prep Date/Time: 10/29/05 17:00				Container ID:1057045014-B	
Dilution Factor: 1							Analyst: VS	



Satori Group, Inc.

Print Date: 11/15/2005

Client Sample ID: **0510FROAWA-12**
SGS Ref. #: 1057045015
Project ID: Ft Richardson Groundwater
Matrix: Water (Surface, Eff., Ground)

All Dates/Times are Alaska Local Time
Collection Date/Time: 10/19/05 18:15
Receipt Date/Time: 10/20/05 11:53
Location: AP-4342

Dissolved Metals

<u>Parameter</u>	<u>Result</u>	<u>PQL/CL</u>	<u>MDL</u>	<u>Units</u>	<u>DF</u>	<u>Analytical Batch</u>	<u>Prep Batch</u>	<u>Qualifiers</u>
Aluminum	ND	100	31.0	ug/L	5	MMS3863	MXX16524	
Arsenic	ND	10.0	3.10	ug/L	5	MMS3863	MXX16524	
Iron	ND	1000	310	ug/L	5	MMS3863	MXX16524	
Manganese	1.58 J	2.00	0.620	ug/L	5	MMS3863	MXX16524	

Batch Information

Analytical Batch: MMS3863
Analytical Method: SW6020 Diss.
Analysis Date/Time: 10/31/05 14:10
Dilution Factor: 5

Prep Batch: MXX16524
Prep Method: FILTER
Prep Date/Time: 10/19/05 18:15

Initial Prep Wt./Vol.: 100 mL
Prep Extract Vol.: 100 mL
Container ID: 1057045015-I
Analyst: TK



Satori Group, Inc.

Print Date: 11/15/2005

Client Sample ID: 0510FROAWA-12
SGS Ref. #: 1057045015
Project ID: Ft Richardson Groundwater
Matrix: Water (Surface, Eff., Ground)

All Dates/Times are Alaska Local Time
Collection Date/Time: 10/19/05 18:15
Receipt Date/Time: 10/20/05 11:53
Location: AP-4342

Waters Department

<u>Parameter</u>	<u>Result</u>	<u>PQL/CL</u>	<u>MDL</u>	<u>Units</u>	<u>DF</u>	<u>Analytical Batch</u>	<u>Prep Batch</u>	<u>Qualifiers</u>
Sulfate	22.4	0.100	0.0310	mg/L	1	WIC3768		
Total Nitrate/Nitrite-N	3.02	0.100	0.0310	mg/L	5	WFI1073		

Batch Information

Analytical Batch: WFI1073	Initial Prep Wt./Vol.: 100 mL
Analytical Method: EPA 353.2	
Analysis Date/Time: 10/20/05 17:22	Container ID:1057045015-G
Dilution Factor: 5	Analyst: AZS
<hr/>	
Analytical Batch: WIC3768	Initial Prep Wt./Vol.: 5 mL
Analytical Method: EPA 300.0	
Analysis Date/Time: 10/21/05 15:30	Container ID:1057045015-H
Dilution Factor: 1	Analyst: JEM



Satori Group, Inc.

Print Date: 11/15/2005

Client Sample ID: **0510FROAWA-12**
SGS Ref. #: 1057045015
Project ID: Ft Richardson Groundwater
Matrix: Water (Surface, Eff., Ground)

All Dates/Times are Alaska Local Time
Collection Date/Time: 10/19/05 18:15
Receipt Date/Time: 10/20/05 11:53
Location: AP-4342

Light Gases

<u>Parameter</u>	<u>Result</u>	<u>PQL/CL</u>	<u>MDL</u>	<u>Units</u>	<u>DF</u>	<u>Analytical Batch</u>	<u>Prep Batch</u>	<u>Qualifiers</u>
Methane	ND	5.00	1.50	ug/L	1	GAS1263		

Batch Information

Analytical Batch: GAS1263
Analytical Method: RSK-175
Analysis Date/Time: 10/28/05 13:26
Dilution Factor: 1

Initial Prep Wt./Vol.: 1 mL
Container ID:1057045015-D
Analyst: KWM



Satori Group, Inc.

Print Date: 11/15/2005

Client Sample ID: **0510FROAWA-12**
 SGS Ref. #: 1057045015
 Project ID: Ft Richardson Groundwater
 Matrix: Water (Surface, Eff., Ground)

All Dates/Times are Alaska Local Time
 Collection Date/Time: 10/19/05 18:15
 Receipt Date/Time: 10/20/05 11:53
 Location: AP-4342

Volatile Gas Chromatography/Mass Spectroscopy

<u>Parameter</u>	<u>Result</u>	<u>PQL/CL</u>	<u>MDL</u>	<u>Units</u>	<u>DF</u>	<u>Analytical Batch</u>	<u>Prep Batch</u>	<u>Qualifiers</u>
Dichlorodifluoromethane	ND	1.00	0.310	ug/L	1	VMS7995	VXX14631	
Chloromethane	ND	1.00	0.310	ug/L	1	VMS7995	VXX14631	
Vinyl chloride	ND	1.00	0.310	ug/L	1	VMS7995	VXX14631	
Bromomethane	ND	3.00	0.940	ug/L	1	VMS7995	VXX14631	
Chloroethane	ND	1.00	0.310	ug/L	1	VMS7995	VXX14631	
Trichlorofluoromethane	ND	1.00	0.310	ug/L	1	VMS7995	VXX14631	
1,1-Dichloroethene	ND	1.00	0.310	ug/L	1	VMS7995	VXX14631	
Methylene chloride	ND	5.00	1.00	ug/L	1	VMS7995	VXX14631	
Carbon disulfide	ND	2.00	0.620	ug/L	1	VMS7995	VXX14631	
Acetone	ND	10.0	3.10	ug/L	1	VMS7995	VXX14631	
trans-1,2-Dichloroethene	ND	1.00	0.310	ug/L	1	VMS7995	VXX14631	
1,1-Dichloroethane	ND	1.00	0.310	ug/L	1	VMS7995	VXX14631	
2,2-Dichloropropane	ND	1.00	0.310	ug/L	1	VMS7995	VXX14631	
cis-1,2-Dichloroethene	ND	1.00	0.310	ug/L	1	VMS7995	VXX14631	
2-Butanone (MEK)	ND	10.0	3.10	ug/L	1	VMS7995	VXX14631	
Bromochloromethane	ND	1.00	0.310	ug/L	1	VMS7995	VXX14631	
Chloroform	ND	1.00	0.300	ug/L	1	VMS7995	VXX14631	
1,1,1-Trichloroethane	ND	1.00	0.310	ug/L	1	VMS7995	VXX14631	
Carbon tetrachloride	0.680 J	1.00	0.310	ug/L	1	VMS7995	VXX14631	
1,1-Dichloropropene	ND	1.00	0.310	ug/L	1	VMS7995	VXX14631	
Benzene	ND	0.400	0.120	ug/L	1	VMS7995	VXX14631	
Trichloroethene	ND	1.00	0.310	ug/L	1	VMS7995	VXX14631	
1,2-Dichloropropane	ND	1.00	0.310	ug/L	1	VMS7995	VXX14631	
Dibromomethane	ND	1.00	0.310	ug/L	1	VMS7995	VXX14631	
Bromodichloromethane	ND	0.500	0.150	ug/L	1	VMS7995	VXX14631	
2-Chloroethyl Vinyl Ether	ND	10.0	3.10	ug/L	1	VMS7995	VXX14631	
cis-1,3-Dichloropropene	ND	0.500	0.150	ug/L	1	VMS7995	VXX14631	
Toluene	ND	1.00	0.310	ug/L	1	VMS7998	VXX14631	
trans-1,3-Dichloropropene	ND	1.00	0.310	ug/L	1	VMS7995	VXX14631	
1,1,2-Trichloroethane	ND	1.00	0.310	ug/L	1	VMS7995	VXX14631	
Tetrachloroethene	55.9	1.00	0.310	ug/L	1	VMS7995	VXX14631	
1,3-Dichloropropane	ND	0.400	0.120	ug/L	1	VMS7995	VXX14631	
Dibromochloromethane	ND	0.500	0.150	ug/L	1	VMS7995	VXX14631	
1,2-Dibromoethane	ND	1.00	0.310	ug/L	1	VMS7995	VXX14631	
Chlorobenzene	ND	0.500	0.150	ug/L	1	VMS7995	VXX14631	
1,1,1,2-Tetrachloroethane	ND	0.500	0.150	ug/L	1	VMS7995	VXX14631	
Ethylbenzene	ND	1.00	0.310	ug/L	1	VMS7995	VXX14631	



Satori Group, Inc.

Print Date: 11/15/2005

Client Sample ID: **0510FROAWA-12**
 SGS Ref. #: 1057045015
 Project ID: Ft Richardson Groundwater
 Matrix: Water (Surface, Eff., Ground)

All Dates/Times are Alaska Local Time
 Collection Date/Time: 10/19/05 18:15
 Receipt Date/Time: 10/20/05 11:53
 Location: AP-4342

Volatile Gas Chromatography/Mass Spectroscopy

<u>Parameter</u>	<u>Result</u>	<u>PQL/CL</u>	<u>MDL</u>	<u>Units</u>	<u>DF</u>	<u>Analytical Batch</u>	<u>Prep Batch</u>	<u>Qualifiers</u>
P & M -Xylene	ND	2.00	0.620	ug/L	1	VMS7995	VXX14631	
Styrene	ND	1.00	0.310	ug/L	1	VMS7995	VXX14631	
Bromoform	ND	1.00	0.310	ug/L	1	VMS7995	VXX14631	
Isopropylbenzene (Cumene)	ND	1.00	0.310	ug/L	1	VMS7995	VXX14631	
Bromobenzene	ND	1.00	0.310	ug/L	1	VMS7995	VXX14631	
o-Xylene	ND	1.00	0.310	ug/L	1	VMS7995	VXX14631	
1,1,2,2-Tetrachloroethane	ND	0.500	0.150	ug/L	1	VMS7995	VXX14631	
1,2,3-Trichloropropane	ND	1.00	0.310	ug/L	1	VMS7995	VXX14631	
n-Propylbenzene	ND	1.00	0.310	ug/L	1	VMS7995	VXX14631	
2-Chlorotoluene	ND	1.00	0.310	ug/L	1	VMS7995	VXX14631	
4-Chlorotoluene	ND	1.00	0.310	ug/L	1	VMS7995	VXX14631	
1,3,5-Trimethylbenzene	ND	1.00	0.310	ug/L	1	VMS7995	VXX14631	
tert-Butylbenzene	ND	1.00	0.310	ug/L	1	VMS7995	VXX14631	
1,2,4-Trimethylbenzene	ND	1.00	0.310	ug/L	1	VMS7995	VXX14631	
sec-Butylbenzene	ND	1.00	0.310	ug/L	1	VMS7995	VXX14631	
4-Isopropyltoluene	ND	1.00	0.310	ug/L	1	VMS7995	VXX14631	
1,4-Dichlorobenzene	ND	0.500	0.150	ug/L	1	VMS7995	VXX14631	
1,2-Dichlorobenzene	ND	1.00	0.310	ug/L	1	VMS7995	VXX14631	
1,3-Dichlorobenzene	ND	1.00	0.310	ug/L	1	VMS7995	VXX14631	
n-Butylbenzene	ND	1.00	0.310	ug/L	1	VMS7995	VXX14631	
1,2-Dibromo-3-chloropropane	ND	2.00	0.620	ug/L	1	VMS7995	VXX14631	
1,2,4-Trichlorobenzene	ND	1.00	0.310	ug/L	1	VMS7995	VXX14631	
Hexachlorobutadiene	ND	1.00	0.310	ug/L	1	VMS7995	VXX14631	
Naphthalene	ND	2.00	0.620	ug/L	1	VMS7995	VXX14631	
1,2,3-Trichlorobenzene	ND	1.00	0.310	ug/L	1	VMS7995	VXX14631	
4-Methyl-2-pentanone (MIBK)	ND	10.0	3.10	ug/L	1	VMS7995	VXX14631	
2-Hexanone	ND	10.0	3.10	ug/L	1	VMS7995	VXX14631	
Methyl-t-butyl ether	ND	5.00	1.50	ug/L	1	VMS7995	VXX14631	
1,2-Dichloroethane	ND	0.500	0.150	ug/L	1	VMS7995	VXX14631	
Dibromofluoromethane <surr>	96.3	85-115		%	1	VMS7995	VXX14631	
1,2-Dichloroethane-D4 <surr>	98.9	72-119		%	1	VMS7995	VXX14631	
Toluene-d8 <surr>	102	85-120		%	1	VMS7995	VXX14631	
4-Bromofluorobenzene <surr>	109	76-119		%	1	VMS7995	VXX14631	



Satori Group, Inc.

Print Date: 11/15/2005

Client Sample ID: 0510FROAWA-12
SGS Ref. #: 1057045015
Project ID: Ft Richardson Groundwater
Matrix: Water (Surface, Eff., Ground)

All Dates/Times are Alaska Local Time
Collection Date/Time: 10/19/05 18:15
Receipt Date/Time: 10/20/05 11:53
Location: AP-4342

Volatile Gas Chromatography/Mass Spectroscopy

<u>Parameter</u>	<u>Result</u>	<u>PQL/CL</u>	<u>MDL</u>	<u>Units</u>	<u>DF</u>	<u>Analytical</u> <u>Batch</u>	<u>Prep</u> <u>Batch</u>	<u>Qualifiers</u>
Batch Information								
Analytical Batch: VMS7995			Prep Batch: VXX14631				Initial Prep Wt./Vol.: 5 mL	
Analytical Method: SW8260B			Prep Method: SW5030B				Prep Extract Vol.: 5 mL	
Analysis Date/Time: 10/29/05 22:21			Prep Date/Time: 10/29/05 17:00				Container ID:1057045015-A	
Dilution Factor: 1							Analyst: VS	
Analytical Batch: VMS7998			Prep Batch: VXX14631				Initial Prep Wt./Vol.: 5 mL	
Analytical Method: SW8260B			Prep Method: SW5030B				Prep Extract Vol.: 5 mL	
Analysis Date/Time: 10/31/05 23:56			Prep Date/Time: 10/29/05 17:00				Container ID:1057045015-B	
Dilution Factor: 1							Analyst: VS	

**FINAL REPORT
FORT RICHARDSON
OUE-AVMA**

**APPENDIX E: LABORATORY REVIEW
DATA**

FORT RICHARDSON, ALASKA

PREPARED FOR:



**U.S. Army, Directorate of Public Works
Contract No. W911KB-04-P-0091**

June 2006



**US Army
Installation Management Agency**



**US Army Corps
of Engineers®
Alaska District**



**Satori Group, Inc.
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Fax: 907.243-6301

April 24, 2006

To: Mr. Derek Lucas
Satori Group, Inc.
1310 East 66th Avenue, Suite #2
Anchorage, Alaska 99518

Subject: Fort Richardson Operable Unit E

Dear Mr. Lucas:

Shaw has prepared the following data quality evaluation report in support of October 2005 groundwater monitoring of Fort Richardson Operable Unit E.

Introduction

The objective of this data quality evaluation (DQE) report is to assess the data quality of analytical results for water samples collected for groundwater monitoring at Fort Richardson armored vehicle maintenance area, Operable Unit E (OUE) location as outlined in the 2004 sampling and analysis plan (SAP) prepared in by Satori Group, Inc. Samples were collected and analyzed to provide a framework for long-term monitoring of the groundwater. The data may also be used to support future activities such as feasibility studies, risk assessments, fate and transport modeling and remedial actions. Individual method quality control (QC) limits were evaluated against laboratory supplied QC limits. This report is intended as a general data quality assessment designed to summarize data issues.

Analytical Data

This DQE report covers a total of ten normal environmental samples, one field duplicate sample, one field designated Matrix Spike/Matrix Spike Duplicate (MS/MSD) sample, one equipment rinse sample and trip blank samples for volatile analysis methods were submitted, and one trip blank each for VOC by SW8260B and light hydrocarbons by RSK-175 methods. These samples were reported under one sample delivery group (SDG) as SGS Environmental Services (SGS) report 1057045. Samples were collected from October 18, 2005 to October 19, 2005 and then hand-delivered by Satori to SGS on October 20, 2005 for analysis. Field samples were analyzed for the following analytes/methods:

Table 1 - Analytical Parameter

Parameter	Method	Laboratory
Methane	RSK-175	SGS – Anchorage
Volatile Organic Compounds – (VOC)	SW8260B	SGS – Anchorage
Polynuclear Aromatic Hydrocarbons – (PAH)	SW8270C-SIM	SGS – Anchorage
Sulfate	EPA 300.0	SGS – Anchorage
total Nitrate+Nitrite	EPA 353.2	SGS – Anchorage
Dissolved Metals - Aluminum, Arsenic, Iron and Manganese	SW6020	SGS – Anchorage

SIM – Selective ion Monitoring

The assessment of data includes a review of: Chain-of-Custody (CoC) documentation; holding time compliance, method required QC samples at the specified frequencies, evaluation and flagging for method blanks, evaluation and flagging for laboratory control spiking samples, evaluation and flagging for surrogate spike recoveries for organic analyses, evaluation of MS/MSD samples on a site/location basis.

Field samples were also reviewed to ascertain field compliance and data quality issues. This included the review of trip blanks, equipment blanks and field duplicates as required by the Satori SAP.

Data flags were assigned according to the following criteria. These flags, as well as the reason for each flag can be found in Table 2. Multiple flags may be applied to specific sample method/matrix/analyte combinations, but there will be only one final flag. A final flag is applied to the data and is the most conservative of the applied validation flags. The final flags also include matrix and blank sample impacts.

The data flags that may be used for this review are defined below:

- J = Analyte is present but the reported value may not be accurate or precise (estimated).
- J+ = Analyte is present but the reported value may not be accurate or precise (estimated bias high).
- J- = Analyte is present but the reported value may not be accurate or precise (estimated bias low).
- R = The data are unusable due to deficiencies in the ability to analyze the sample and meet QC criteria.
- U = Analyte was not detected at the specified detection limit.
- UJ = Analyte was not detected and the specified detection limit may not be accurate or precise (estimated).

Findings

The frequency of field and laboratory quality control samples and the associated control criteria are specified in the Satori SAP. Laboratory supplied control criteria were used to evaluate the laboratory data. In the following method specific discussions, only the criteria exceedances that impact data qualification are discussed. Note that review and data flagging for laboratory initial instrument calibration and continuing calibration verification was not included as part of this review.

RSK-175 - Methane

Trip Blank

A trip blank sample was not included in the laboratory report 1057045 for OUE samples, however it was noted from the CoC that samples for OUE were received in the same cooler as the OUB trip blank sample 0510FROBWA-36 which was reported in SGS report # 1057046. Trip blank sample 0510FROBWA-36 was used to assess methane trip blank contamination for the OUE samples of report 1057045. No trip blank contamination was present.

There were no other QA/QC anomalies for the methane results, no sample methane results required qualification.

SW8260B -VOC

Laboratory and Field Blanks

The method blank samples were free of contamination for all target analytes, no laboratory contamination was observed.

A trip blank sample was not included in the laboratory report 1057045 for OUE samples, however it was noted from the CoC that samples for OUE were received in the same cooler as OUB trip blank sample 0510FROBWA-35 which was reported in SGS report # 1057046. Trip blank sample 0510FROBWA-35 was used to assess VOC trip blank contamination for the OUE samples of report 1057045.

Trip blank sample 0510FROBWA-35 had toluene detected at 0.610 ug/L and tetrachloroethene at 1.4 ug/L. Field sample 0510FROAWA-02 had comparable levels of tetrachloroethene that was potentially due to similar trip contamination, this result has been flagged as estimated bias high (J+). All other OUE samples had tetrachloroethene results that were either reported as undetected or were significantly higher than the contamination level observed in the trip blank. No other VOC samples required flagging due to trip blank contamination.

Equipment blank sample 0510FROAWA-09 had toluene detected at 0.370 ug/L. This contamination may be due to the same source of contamination as the trip blank. None of the OUE field samples had toluene detected so there was no impact on the field sample results.

Matrix Spike/Matrix Spike Duplicate

The compound 2-chloroethyl vinyl ether was not recovered from the MS/MSD samples. This compound was hydrolyzed by the samples acid preservative and lost. Accurate recovery and detection of this compound from acid preserved samples is not possible. The results for this compound are qualified as rejected (R) due to inability of the method to accurately detect this compound in preserved samples. Please note that 2-chloroethyl vinyl ether was not included on the SAP required analyte list.

There were no other QA/QC anomalies for the SW8260B VOC method results.

SW8270C–SIM - Polynuclear Aromatic Hydrocarbons

There were no QA/QC anomalies for this analysis method. No sample results for this analysis method required validation flagging.

SW6020 - Dissolved Metals

Matrix Spike/Matrix Spike Duplicate

The laboratory did not initially report the results of requested MS/MSD sample 0510FROAWA-06. Laboratory was contacted about the missing MS/MSD results and the results were supplied as an amendment to the report. There were no quality control outliers for this analysis method. No sample results for this analysis method required validation flagging.

E300.0 - Sulfate

Matrix Spike/Matrix Spike Duplicate

Laboratory did not perform a matrix spike duplicate of requested sulfate sample 0510FROAWA-06. The laboratory instead performed a laboratory duplicate analysis of an unspiked field sample to determine the precision for batch which was within control limits. There were no QA/QC anomalies for this analysis method. No sample results for this analysis method required validation flagging.

E353.2 - Total Nitrate and Nitrite

Samples were requested for total nitrate+nitrite analysis by method E300.0. Laboratory substituted analysis method E353.2 for total nitrate+nitrite. There is no significant impact to the results due to substitution of method E353.2.

Matrix Spike/Matrix Spike Duplicate

Laboratory did not perform a matrix spike duplicate of requested sample 0510FROAWA-06 for total nitrate+nitrite. The laboratory instead performed a lab duplicate analysis of the unspiked field sample to determine the precision for batch which was within control limits.

The laboratory prepared a matrix spike of sample 0510FROAWA-03. The recovery (89.9%) if rounded is within the 90% lower control limits for total nitrate+nitrite in this matrix spike sample. The MS recovery outlier does not significantly impacted sample results, no validation qualifiers were applied.

Equipment Blank

Total nitrate+nitrite was detected in the equipment rinse blank sample 0510FROAWA-09 indicating potential for cross contamination of this parameter. All field samples except 0510FROAWA-03 had levels of total nitrate+nitrite that were greater than ten times higher than the contamination observed in the equipment blank, these samples are not impacted by the equipment blank contamination. Sample 0510FROAWA-03 had total nitrate+nitrite within ten times the level observed in the equipment blank, so consequently was flagged as an estimate bias high (J+) due to the equipment rinse blank contamination. All other QA/QC parameters were in control for total nitrate + nitrites.

Field Sample Duplicate

The sample identified on the chain of custody as 0510FROAWA-07 (fictitious location AP-3888) was the field duplicate of sample 0510FROAWA-06. All of the primary and field duplicate sample results are in agreement per the requirements of EM 200-1-6 (Chemical Quality Assurance for Hazardous, Toxic and Radioactive Waste [HTRW] projects Table 4-1.)

Chain-of-Custody & Sample Preservation

Samples were received at the laboratory in two coolers with properly completed CoC for each cooler. The coolers were received with temperature blanks within the prescribed range of $4 \pm 2^\circ\text{C}$. The samples were noted as properly preserved, and were prepared and analyzed within method specified holding times.

Overall Assessment

The final activity in the data quality evaluation is an assessment of whether the data meets the objectives of the Satori SAP. The goal of this assessment is to demonstrate that a sufficient number of representative samples were collected and the precision, accuracy, representativeness, completeness and comparability (PARCC) of the resulting analytical data is sufficient to be used to support the decision making process. The following summary highlights the data evaluation findings for the above defined events:

1. The completeness objectives were met for all method/analyte combinations.
2. With the exception of total nitrate+nitrite and VOC compounds in the equipment blank and VOC in the trip blank, no other blank contamination was observed for this project that adversely impacted the sample results.
3. The precision and accuracy of the laboratory data, as measured by laboratory quality control indicators suggest that the data is sufficiently useable for the purposes of this project.
4. The precision measurement for results comparison between primary and duplicate field samples were within the acceptance criteria of EM 200-1-6. All indications are that the field personnel followed the Satori SAP and project documents thereby assuring representativeness of the samples.

Table 2 -- Summary of OUE Results with Qualifier Flags

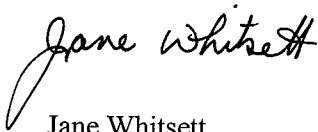
Sample ID	Analytical Method	Analyte	Lab Result	Final Flag	Reason
0510FROAWA-01	SW 8260B	2-chloroethyl vinyl ether	3.1 ug/L	R	MS/MSD
0510FROAWA-02	SW 8260B	2-chloroethyl vinyl ether	3.1 ug/L	R	MS/MSD
0510FROAWA-03	SW 8260B	2-chloroethyl vinyl ether	3.1 ug/L	R	MS/MSD
0510FROAWA-04	SW 8260B	2-chloroethyl vinyl ether	3.1 ug/L	R	MS/MSD
0510FROAWA-05	SW 8260B	2-chloroethyl vinyl ether	3.1 ug/L	R	MS/MSD
0510FROAWA-06	SW 8260B	2-chloroethyl vinyl ether	3.1 ug/L	R	MS/MSD
0510FROAWA-07	SW 8260B	2-chloroethyl vinyl ether	3.1 ug/L	R	MS/MSD
0510FROAWA-08	SW 8260B	2-chloroethyl vinyl ether	3.1 ug/L	R	MS/MSD
0510FROAWA-09	SW 8260B	2-chloroethyl vinyl ether	3.1 ug/L	R	MS/MSD
0510FROAWA-10	SW 8260B	2-chloroethyl vinyl ether	3.1 ug/L	R	MS/MSD
0510FROAWA-11	SW 8260B	2-chloroethyl vinyl ether	3.1 ug/L	R	MS/MSD
0510FROAWA-12	SW 8260B	2-chloroethyl vinyl ether	3.1 ug/L	R	MS/MSD
0510FROAWA-02	SW 8260B	tetrachloroethene	0.330 ug/L	J+	TB
0510FROAWA-03	E353.2	nitrate+nitrite	0.144 mg/L	J+	EB

<u>Term</u>	<u>Definition</u>
J+	Analyte is present but the reported value may not be accurate or precise. (estimate, bias high).
R	The data are unusable due to deficiencies in the ability to analyze the sample and meet the criteria.
MS/MSD	Analyte was not recovered from MS/MSD sample.
TB	Trip Blank contamination present.
EB	Equipment Blank contamination present.

We look forward to our continued business relationship with you. Please feel free to contact me with any questions or if you need additional information.

Sincerely,

Shaw Alaska, Inc.



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